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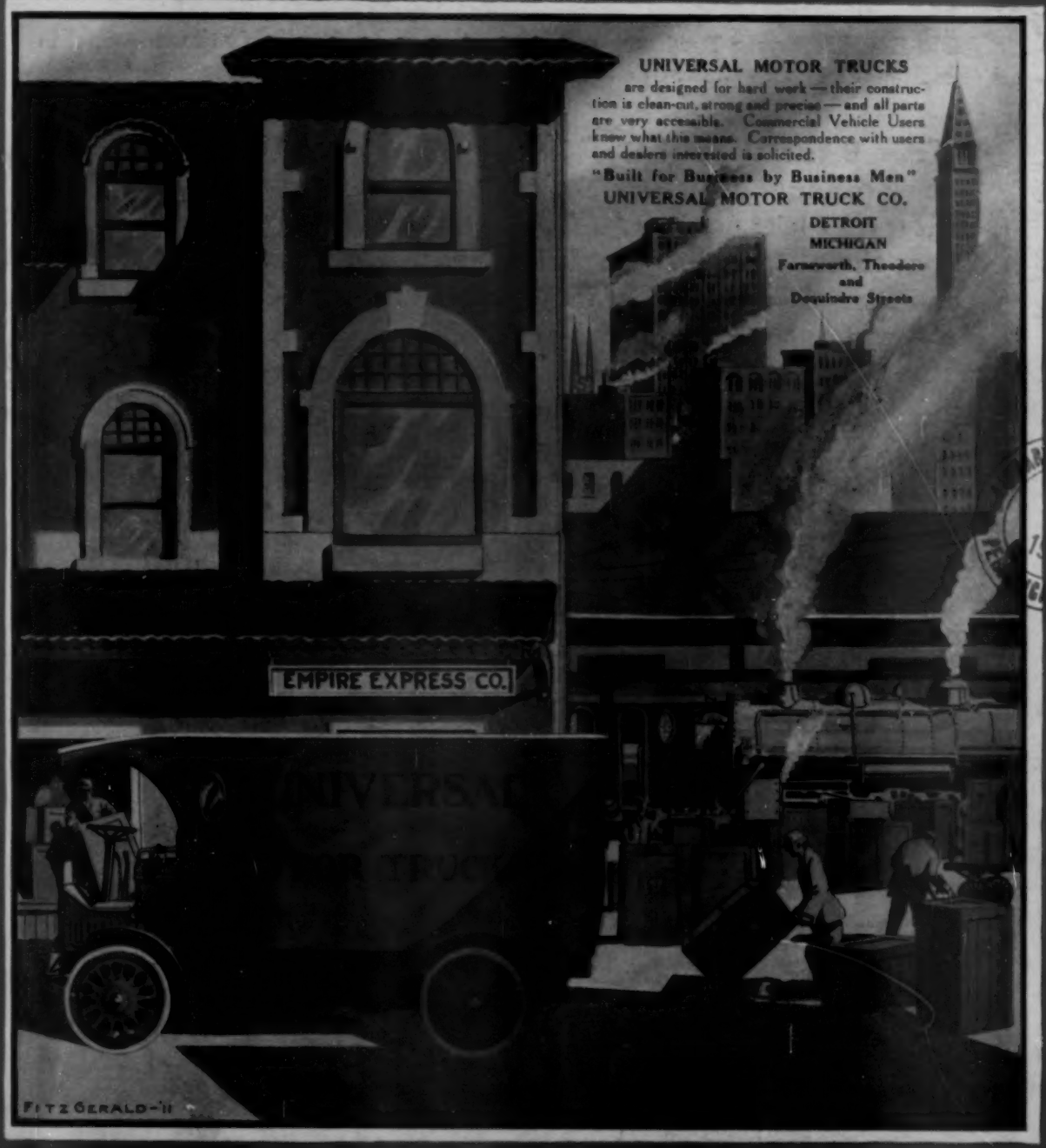
THE COMMERCIAL CAR JOURNAL



PUBLISHED THE 15TH OF EACH MONTH BY CHILTON COMPANY MARKET & 49TH STS. PHILADELPHIA

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¶ The open, loose-knit structure of ordinary bearing bronzes is responsible for countless automobile troubles and for heavy repair and renewal expenses. Flaking off is a characteristic weakness of most commercial bronzes. This in itself should be enough to prohibit their use on motor cars. Any bronze that flakes or granulates soon saturates the lubricating oil with minute metallic particles, causing undue wear, not only to the part itself, but to all other parts of the motor reached by the metallized oil. One need not be a mechanical engineer to appreciate the harmful effect this oil is having on every working part of the motor.

¶ If you are a Motor Truck Manufacturer or a Motor Truck User, we shall be very glad to hear from you and give you particulars in full about NON-GRAN High Speed Bearing Bronze which is now being so largely and so successfully used.

¶ NON-GRAN is built for ultimate economy,—*not* to meet a selling price. Write us now asking for full particulars.

AMERICAN BRONZE COMPANY

BERWYN, PA., U. S. A.

THE PUBLISHERS' PERSONAL PAGE

By C. A. MUSSELMAN

Many Thanks!

We owe our grateful acknowledgments to hundreds of those associated with the automobile trade and to motor truck owners who were gracious enough to convey to us their good opinion of the CCJ. This debt we hope to repay by continually improving our publication. We want to produce a journal that will please every reader, and, furthermore, we want to establish a fraternal feeling, so that no one will hesitate to offer criticisms and suggestions. We believe that by listening to what others may have to tell us about the CCJ, we will learn much which will be of benefit to subscribers and publisher alike. Your co-operation is therefore earnestly solicited and our many thanks are heartily given for the support and words of encouragement accorded us by our friends.

Your Subscription

That is what we are after now. There are many ways of inducing the prospective subscriber to give the publisher an order, but we hope that only one method will be necessary to obtain your subscription. It is our intention to make the CCJ so good and so important to the man who is thinking of buying, who already operates, who sells or makes a commercial car, that he will feel the necessity of becoming a regular reader of our publication. This is the method we intend to pursue in order to obtain your subscription. Merit, and merit alone, is that which will have to win first—your approval and then—your dollar. No matter what your business may be, you are busy looking after the intricacies of your particular calling. We are just as actively engaged in gathering data for the CCJ. It costs us thousands of dollars a month, and it will cost you but $1.00 a year.

From Over the Sea

One of our Foreign correspondents has gathered for us some rather interesting information for this edition, under the heading of "The Truck Situation in Great Britain," by Mr. Frank Palmer. This is a condensed and exceedingly interesting review of the commercial car conditions in England. There will also be described a typical English motor car—the Lacre Truck, which will be of value for purposes of comparison with the construction of American trucks.

A subject of some considerable importance will be dealt with under the title of "Increase in Motor Traffic in London."

Descriptions of Cars

In this issue will appear illustrated descriptions of the Alden Sampson Half-Ton Truck, by Len G. Shaw; the Commer Truck, by E. S. Foljambe; and the Detroit Electric Commercial Car, by Wm. J. Johnson.

Municipal Cars

A most complete and interesting article will appear, dealing with requirements of fire departments throughout the United States. Thirty thousand or more motor fire apparatus will be needed to supply the demand during the next three years. This calculation is based on figures given us by Fire Chiefs in the largest cities in the United States and Canada.

Under sub-heads will appear descriptions of Lowell's Patrol and an article on "The First City to Entirely Do Away With the Horse Patrol-Wagon."

Regular Features

There are certain subjects which never grow old, for there is always information to be had which is of value, and it is for this reason that we will conduct regular departments, among which are: "News of Dealers and Garages;" "Instructive Experiences;" "Among the Manufacturers;" "Truck Accessories and Appliances;" "In the World of Electrics;" "New Commercial Cars."

These departments are in charge of our Managing Editor, Mr. E. S. Foljambe. Anything that you like or dislike or any suggestions for changes that you have to offer, will be thankfully received.

"VENI, VIDI, VICI!"
—and why

Because the CCJ supplies the demand for a publication which has been wanted by truck owners, sellers and makers. The field is ready for cultivation and the CCJ has proved to be the cultivator. How do we know? By the letters we have received from all parts of the United States.

Those who want to buy trucks say that the articles appearing in the March issue are convincing because the data is obtained from truck users, which means that the facts are based upon the experiences of those who know. The truck owners state that it is the medium through which they obtain information enabling them to better their service, reduce maintenance cost and buy what is best adapted to their requirements. The dealer recognizes that it is the source through which he obtains knowledge to buy right and to sell intelligently and profitably. The maker tells us that it is what the industry has long needed—a publication sufficiently attractive to be read by the prospective commercial car buyer, and practical enough to convince every merchant, manufacturer and possible user of the motor-propelled business wagon that the horse is a luxury and the automobile an economy.

It is for these reasons that universal recognition has been accorded the CCJ; hence our pardonable pride in saying:

"Veni, Vidi, Vici!"

Special Articles

The contributions for the April number include several interesting and instructive writings. "The Worm Drive," which is one of the live topics of to-day, will be handled by Mr. Warren Noble, who tells of its advantages and efficiency in service. Mr. H. Kerr Thomas, associated with the manufacturers of the Pierce-Arrow truck, writes an article under the title "Worm vs. Chain Drive for Motor Trucks," to answer an editorial appearing in a machinery paper. Mr. D. R. Hobart gives a very excellent treatise on "Taxicab Service Organization and Maintenance." Chas. L. Eidlitz, M. E., gives details of the Gimbel Bros. Garage in New York, which is the largest modern Electric Garage in the world. Mr. E. S. Foljambe, our Managing Editor, deals with the overloading abuse and suggests a remedy which is accompanied by a detailed mechanical drawing, which will be of interest both to inventors and car owners. Mr. Foljambe donates the inventive ideas contained in this article and drawing to the Commercial branch of the automobile industry. Our Managing Editor has also developed a system for delivery for large stores. The suggestions include a method of routing, distribution through sub-stations and a nesting system which shows the possibility of large trucks doing work in small areas and small trucks in large areas. This original article is one of the most advanced suggestions offered for the solution of delivery problems and shows the possibilities of the commercial car. It is really a very important treatise on this subject.

Mr. Wm. J. Johnson, our regular traveling editorial representative, will have a number of articles and editorials appearing in the April number, including "Motor Truck Tire Depreciation—Part II," and "A Bonus System for Drivers—to Reduce Up-keep Costs, and Increase Efficiency." There is also an editorial, "A Warning to Truck Salesmen," which shows that the "stunts" resorted to, such as carrying enormous loads and traveling at excessive speeds are unwise and unbusinesslike, for the reason that they do not represent every-day service and the trucks would not stand such abuse continuously.

A special feature of the next issue will be a treatise on the use of recording devices by motor truck users and detailed descriptions of practically all the devices now on the market for this purpose. There will be some additional information and articles in regard to the "Nesting System." A special article will also deal with the subject of "Dumping Bodies" for coal, sand, asphalt, etc., especially such bodies as are operated by the power of the truck motor. There will also be interesting and instructive articles on "The Use of Pneumatic Tires on Trucks."

The Commercial Car Journal

VOLUME I. PHILADELPHIA, APRIL 15, 1911 NUMBER 2

Enthusiastic Reception Accorded Announcement of the National Efficiency and Economy Competition for Commercial Car Owners.

The announcement made in our last issue, of the National Efficiency and Economy Competition to be inaugurated by the COMMERCIAL CAR JOURNAL, was received everywhere with flattering enthusiasm, and the fact that there was not a single adverse criticism is significant.

It is the general verdict that the competition is the most practicable and promising of anything which has yet been proposed in the contest line, and will certainly result in the dissemination of information of the greatest value to commercial car manufacturers and users. Many of our readers were enthusiastic in their praise of the project and expressed their readiness to enter their cars in the competition; its success is assured.

The selection of the Governing Committee will be completed in a few days, and a complete set of rules drafted which will be published in the May number of the C. C. J.

Meanwhile, as there has been a great demand for entry blanks, we have inserted one inside of the back cover of this issue, which all who wish to enter their cars may use.

The regular Entry blanks will contain a synopsis of the rules and will be issued as soon as the rules are formulated. The rules will also be issued in pamphlet form and will be sent to all entrants in advance, so that there will be opportunity for criticism and objection on the part of those who are entering their cars.

In addition to the Governing Committee, representatives are being appointed in every city of over 100,000 population to look after any questions which may arise among the competitors in that vicinity, and to these will be added others in any district isolated from the large cities, from which a number of entries have been received.

For the benefit of those of our readers who are not familiar with the details of the National Efficiency and Economy Competition, as published last month, we give herewith a short and concise outline of the competition. Its purpose is to demonstrate the effective and improved service and the economy and efficiency of commercial cars, and to promote care and efficiency on the part of the drivers of the cars.

It will extend over a period of six months, starting in the summer, so that summer and winter weather will both be included. The awards will be based on the total distance covered, total number of stops or deliveries, total weight of loads hauled, the total number of hours in service, the amount of fuel, oil and charging; cost of repairs and replacements, including tires, the cost of housing, wages paid to drivers, helpers, etc., etc.

The cars will be divided into types, and subdivided into classes, so that the service or work performed by all the vehicles in each class will be as nearly identical as possible. There will be four types: Delivery Cars, Trucks, Taxicabs and Omnibuses. Delivery Cars will be subdivided into the following classes: Class A, 250 to 900 lbs.; Class B, 1000 to 2000 lbs.; Class B. L., 1000 to 2000 making long hauls; Class C, 2000 to 4000 lbs.; Class C. L., same weight cars making long hauls. The Trucks into classes as follows: Class A. T., 3000 to 5000 lbs.; Class B. T., 5000 to 9000 lbs.; Class C. T., 9000 to 13,000 lbs., and Class D. T., over 13,000 lbs.

The car owner may enter as many cars in the competition as he wishes. There will be no entrance fee. Daily blanks will be furnished for the driver to fill out after each day's work, and weekly or monthly blanks will be furnished for the week's or month's work by the owner. Cash prizes will be awarded to the winning drivers, and suitable trophies will be given by the Commercial Car Journal, to the winning car owner in each division. Additional prizes have been offered by several prominent manufacturers to the owners of their cars who make the best records.

The names of the entrants will be published in each issue of the Commercial Car Journal, with descriptions and photographs of the cars used, and full details of the service performed by them, while entered in the competition. The awards will be made, and all questions arising during the progress of the competition will be adjusted by a referee, assisted by a committee, all of whom will be well known disinterested experts who are not connected with any concern manufacturing motor cars or parts, or with any of the competitors.

Suggestions Solicited

It requires full investigation, careful consideration and much discussion to arrange all the conditions of an event as broad and far reaching as this one, so as to meet all possible requirements, and it was only after extended conference with many commercial car owners and manufacturers, that the outline of the competition was announced.

It is very flattering to have the plan so forcibly endorsed, and to have received no adverse criticisms. There were, however, a few suggestions made which show that new features can be added which will make the competition more valuable, and we ask all our readers to fully consider each feature of the competition as outlined and to let us have their suggestions as to any additions or alterations which, in their opinion, would better it.

Among the suggestions received are several that appeal to us so strongly that we will mention them here, as they may inspire others of our readers with ideas that will add to the value of the competition.

A Prize for the Most Complete Record

It is suggested that an additional prize be given to the operator furnishing the neatest and most consistently complete record of performance. This is a particularly good suggestion, as the value of the entire competition depends upon the completeness and accuracy of the daily records handed in by the operators.

It is pointed out by another that the indifference of the drivers and also of the owners to the keeping of these records will be the chief obstacle to the success of the competition as a whole, therefore the offering of a substantial prize to the operator who turns in the best record will go a long way toward eliminating this possibility.

Pennants or Numbers on the Cars

Another suggestion which merits consideration is that each machine entered should carry a pennant or sign of some kind displaying the entry number and classification of the car, so that drivers will have something before them to keep the competition continually in mind. The fact that they will see other entries in their daily travels will imbue them with the spirit of competition and spur them on to the making of better records. Furthermore, the very fact of carrying a mark of this kind will have the beneficial influence on the driver who will feel that his handling of the car is under observation of others, and that he is expected to show what good results can be obtained. Another purpose gained by this marking of the cars, is that a general supervision is made possible by it, and each competitor will in a measure be able to keep tabs on the others.

To Publish Data and Result in Book Form for Competitors

It is suggested that after publishing data and information in the Commercial Car Journal each month during the progress of the competition, that the entire record and result be compiled and issued in book form, to be presented to each of the participants at the completion of the competition.

The point is made that the space given the event each month in the COMMERCIAL CAR JOURNAL could scarcely afford means of giving the full details, and that although it will be interesting in this form, as it will keep the competitors informed on the progress made, it will at best be a disjointed record, and the facts could be much more satisfactorily set forth in one complete volume at the finish. Such a volume would also be a salable book as it would necessarily contain much valuable information for all interested in commercial motor cars.

A suggestion is made that there is more necessity for providing a long distance division in the heavy truck classes than in the delivery classes as was suggested in our last issue. There is no doubt but that that is so, and we believe that all the truck classes should have two divisions, one for short hauls, and the other for long hauls.

It would be almost obligatory on each entrant to have his vehicles equipped with speed and mileage recording devices. This is not absolutely necessary, as the distance in cities, at least, can very readily be computed or estimated, especially where the service is the same or practically the same each day. That is to say, where a wagon covers the same route every day, the distance of this route can very readily be calculated, and the number of times it is covered would be easy to ascertain, and therefore the total mileage would be easy to compute. We are, however, very great believers in recording devices, and believe that commercial cars should not only be equipped with odometer and speedometers, but that instruments showing every movement of the car are desirable, as they are an absolute check upon the driver, and also make records which cannot be tampered with.

REPORT OF REGULAR MONTHLY MEETING OF ELECTRIC VEHICLE ASSOCIATION OF AMERICA

The regular monthly meeting of the Electric Vehicle Association of America was held March 28th, in the Engineering Society's building, New York City, President W. H. Blood, Jr., in the chair. The report of committees showed that a fund of $23,000 had already been raised by the Publicity Committee from the central station interest, $25,000 being the objective point, and $25,000 more is expected from manufacturers. This $50,000 fund will be used in a national campaign to let the people know the advantages of electrically propelled cars. The Membership Committee reported active work. Committee on Standardization reported that they had about decided on definite recommendations to make in regard to charging plugs for pleasure vehicles. The Committee on Insurance and other committees are now getting down to actual work.

The speaker of the evening, Mr. Dan C. Swander, manager of the Firestone Tire & Rubber Co., of New York, then read a paper on Tires—Their Use and Abuse, extracts from which we herewith reproduce.

The Motor Truck Club of New York City will conduct a parade of commercial motor cars on April 15th. The route of the parade will be from 80th street, down Broadway to 42nd, to 5th avenue, to 110th street.

M. C. A. MEMBERSHIP INCREASING

Membership in the Manufacturers' Contest Association is increasing rapidly. Within the last two months twelve new automobile makers have joined, making a total roster to date of forty-eight. Within the next month at least twenty more are expected to become affiliated with the association.

The move to interest the commercial car makers, which began at Chicago during the Chicago show, has proven a step in decidedly the right direction. The manufacturers of these utility motor vehicles appreciate the great benefit that well-managed contests will play in the future of their business. In Germany, France and England the records made in regularly organized commercial vehicle contests are a potent selling argument referred to by prospective customers as a business matter. These records must be accurate, fair and not give a misleading impression.

The Manufacturers' Contest Association has now in hand preliminary data as a basis for its recommendations to the contest board of the American Automobile Association as to what should be the rules to govern commercial car contests. Howard Marmon, chairman of the general rules committee of the M. C. A., will appoint in the very near future a special rules committee of five which will perform the same mission in regard to commercial car contest rules as the present active rules committee of five has to do with pleasure car regulations. Mr. Marmon will also recruit the general rules committee of twenty-five up to its limit, adding in vacant places prominent representatives of the commercial car interests.

N. Y. ELECTRIC WAGON AGENTS ORGANIZE

The Electric Automobile Dealers' Association of New York, has been formed for the purpose of promoting sales of electric vehicles. Albert Weatherby, representing the Detroit Electric, is president, Harvey Robinson, of the New York Edison Company, is vice president; C. Y. Kenworthy, of Rauch & Lang, is secretary, and the directors are M. Platt, of the Baker Vehicle Co.; C. E. Humphrey, of the Woods Electric Co.; A. W. Blanchard, of the Waverley Electric Co., W. C. Brown and R. S. Bailey & Co., and Mr. Clayton, of Studebaker Bros. Co.

NEW YORK-CHICAGO TRUCK CONTEST POSTPONED

The much heralded motor truck contest of the Chicago Motor Club, which was scheduled to take place during the latter part of July, has been abandoned for the present. The contest committee felt that it was about a year ahead of time in running such a contest, and that many of the manufacturers were not ready at this time. By waiting a year, however, it would be possible to include all representative concerns. The idea will, however, be carried out during the summer of 1912.

CHICAGO SHOW ENLARGED

The Chicago Show will have considerable more space available for next year's show. Manager Miles has arranged to build an additional gallery about 30 feet in depth running entirely around the building about 10 feet below the present gallery, so that about 20,000 square feet of additional show space will be available. It is understood that the accessories will be transferred from the upper gallery to this one, and the upper gallery used for complete vehicles. The principal reason for making this change is the additional demand for space to show commercial vehicles.

GOVERNMENT ORDERS ELECTRICS

As an illustration that the electric commercial car has come into its own, the federal government has recently placed an order with the Anderson Electric Car Company for several Detroit electric trucks, for use in handling ammunition and stores at the forts and arsenals. The Anderson Company is shipping one of its one-ton commercial wagons to the United States arsenal at Davenport, Ia.

Everyone knows how conservative are the federal authorities in taking up an innovation in the commercial or military world, and the purchase of electric commercial cars is most significant.

The Motor Truck Association of Chicago will organize a division of commercial vehicles in the annual Chicago parade of automobiles. At its last meeting the following subjects were discussed: better facilities for handling freight at depots; unionizing of drivers of motor trucks; reduction of the wheel tax; uniform demonstration charges. It has also decided to appoint a salaried manager to take charge of its affairs.

N. A. A. M. SAYS COMMERCIAL VEHICLE MANUFACTURERS' ASSOCIATION NOT NECESSARY

The National Association of Automobile Manufacturers, 7 East 42nd Street, New York City, have recently sent notifications to the various manufacturers calling attention to the fact that there is no neccessity for the formation of a Commercial Vehicle Manufacturers' Association. In this letter it is pointed out that the National Association of Automobile Manufacturers is already carrying on the kind of work which would be helpful to those manufacturing commercial vehicles, that they have for eleven years successfully looked after the interests of the makers of pleasure vehicles, many of whom are also commercial car manufacturers, that the Association has already conducted two successful commercial vehicle exhibits; that they have a special committee whose business it is to care for the interests of commercial vehicle manufacturers; that they have recently induced insurance companies to remove the extra premium charged steamship companies to whose docks gasoline vehicles were admitted, and furthermore that the commercial vehicle committee is now working on the question of the standardization of tires and rims, the regulation of truck shows and contests, the adoption of a Standard Warranty, regulation of freight rates, etc. They also state that they now have a fund of nearly $90.000 with which to carry on such work, so that both as to men and money they can properly represent the interests of commercial vehicle manufacturers.

EXPERIMENTAL U. S. MAIL SERVICE

Congress is considering a bill providing for the establishment of an experimental motor mail, express and passenger service. If the bill which has been introduced is passed by both branches of the Legislature, sufficient money will be appropriated to provide for the experimental machine. This machine is to have a carrying capacity of 10 passengers and 1,500 lbs. of freight and mail. The cost of transportation on rural routes is expected to be about as follows:

Adults, 10 cents a single trip; school children, 5 cents; merchandise or baggage contained in a box 3 inches by 6 inches by 12 inches, 1 cent within the route; parcels half the size of a suit case, 5 cents; parcels full size of a suit case, 15 cents; half barrel capacity, 20 cents; barrel, 25 cents.

No parcel over six feet in length to be carried. Only macadamized routes are to be followed and the machines must be able to make at least 100 miles daily.

PARIS P. O. ORDERS 141 NEW CARS

The Paris postal authorities recently found that they would either have to secure new motor driven mail carrying vehicles or else resort to the greater evil of going back to the horse, by reason of the inefficient equipment supplied by contractors. The authorities are now asking for bids for the supply and maintenance of 141 new machines.

When the new equipment is furnished it will be employed in hauling mail between railroad depots and post-offices and outlying stations.

COMPARISON OF COSTS OF DIFFERENT MILEAGE SHOULD BE KNOWN

Taking figures computed for a period of six months, beginning in August and ending in February, a large Brooklyn, N. Y., department store has shown by comparison that it saved $1360 through motor truck delivery as against the old system of similar service by horse wagons. The company operated eleven trucks during this period, one of them of the three ton variety and the remaining ten of one ton carriage. The total cost, everything figured, was $7349, while the year previous during the same months when horse delivery of merchandise was utilized, the cost was $8709. Commenting upon this showing, F. F. Phillips, manager of the solid motor tire department of the United States Tire Company says:

"There are many more concerns actually showing as great a saving who do not know it because of their indifferent methods of keeping track of the work done and mileage covered by their vehicles. It is a common thing to have a user of commercial motor vehicles say that his 'motor vehicles cost so much' to operate, while his 'horse vehicles only cost so much.' This is an admission on the part of the merchant that he does not really know which system is delivering his goods the cheaper. In order to make a true comparison he must adopt some unit of measurement that will have a fixed and determined effect upon the cost that is in direct proportion to the number of miles a given weight is carried. The unit in ordinary use is the 'ton mile,' but this might be altered to packages delivered and miles run, making two figures to be compared—one the cost per package, and the other the cost per mile. The number of packages delivered could easily be ascertained from the shipping memos. or route sheet.

"In order to obtain accurate calculations the mileage figured should be actual and not estimated, for while there are some shipping clerks who can estimate the mileage very closely on any given route, they surely will not have time to do this every day, especially if the service is a large and busy one. The only way to get actual mileage is by an odometer, of which there are several good ones on the market. The odometer could be read daily, weekly or even monthly and would give the exact mileage covered by the vehicle. With this, information of packages delivered and mileage covered as a basis all kinds of comparative figures could be compiled, such as consumption of gasoline, electricity, lubricating oils, tire costs, accident liability and general repairs, all of which should rise and fall as the mileage and weight carried increases or decreases.

"With these figures before him the operating man could put his finger on any unusual cost and direct his efforts to cutting it down rather than waste his time trying to cut down some expense that is as low as it can be. And he never would be placed in a position where he would say, 'he laid up his trucks because the tire expense was too high,' as one has said, but he would have seen that this item of expense was running high and would have investigated it and found the reason. For reason there must be. And when he finds that the high tire cost is due to overloading the vehicle or poor selection of tires, or that the tires are too small for his vehicle, he will proceed to remedy the fault rather than throw away his equipment.

"A simple system along these lines would be of great help in the operation of motor vehicles and of value to the owner and manufacturer. And as a matter of fact, without some such system, I do not see how any intelligent operation of motor vehicles can be carried on."

MOSCOW TO HAVE MOTOR MAIL WAGONS

Russia, slow as it may be thought by Americans, is at least beginning to adopt up-to-date postal methods. The Moscow Post Office has made a contract with an automobile company for carrying all mails between the general and branch offices and the railroad stations. Consul General Snodgrass says: "There are to be 23 motors, carrying capacity 2,160 pounds each, and 2 platform trucks, each carrying 6,480 pounds. These automobiles are all of 20-horsepower and of French origin. The contract, including chauffeurs, is $3,708 a year for each motor; total, $92,700. Since the introduction of the 25 motors the number of horses used in carrying the mails has been reduced from 252 to 148, which will be further reduced this year when 15 more motors are added. It is also intended to install a few cars of 10,800 pounds capacity. The new arrangement was considered the most economical, considering local conditions."

TRUCK HARVESTS CROPS

The economy of the motor truck and the various uses to which it is adapted is illustrated by an up-to-date farmer of Beach, N. D., by the name of Smith. His automobile truck draws his plows, harrows and seeders, making one operation of the putting in of the crop. When the grain is ripe the motor truck draws the reaper that harvests it. The motor of the truck runs the threshing machine, and when the threshing is done the truck is used to haul the crop to the market, 1,000 bushels at one time. It costs this farmer $5.55 an acre from the time of the breaking of the ground to the landing of his crop at the market. He keeps one horse on his farm.

LARGE DEPARTMENT STORE INSTALLS AUTO COACH SERVICE

The Star Store of Indianapolis, Ind., recently instituted a free auto coach service, consisting of twelve-passenger Overland coaches with uniformed driver and coachman. The Star Store is the second Indianapolis establishment to install the metropolitan idea.

The routing will be: From the store to the southeast corner of Washington and Illinois streets and the southeast corner of Washington and Meridian streets; to the store from the southeast corner of Washington and Pennsylvania streets, northwest corner of Washington and Meridian streets, northwest corner of Washington and Illinois streets.

The Minneapolis Motor Truck Company is in financial difficulties, with liabilities of $30,461, and assets of $3,934.

The National Association of Automobile Manufacturers recently appointed a committee to look after commercial motor car subjects particularly. This committee consists of S. D. Waldron, Packard Motor Car Co., Walter C. White, of the White Company, E. S. Kelley, of the Kelley Motor Truck Co., and two other members.

THE COMMERCIAL CAR JOURNAL

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CONTENTS

THE C. C. J. HAS MADE A "HIT"

It is but natural that the publisher who spends years in the contemplation of an ideal publication should, after the first issue, await with a certain trepidation the reception accorded the realization of his dreams.

It is therefore most gratifying for the publishers of the C. C. J. to know that the first issue of this publication has been accorded universally favorable recognition and given credit for filling a long-felt want. From all points of the United States, from the trade and from owners of commercial cars, letters have been received congratulating us upon the appearance and contents. We have been told that it is a journal which will materially assist in the up-building of the commercial car industry. We have been told that it will enable the buyer of trucks to more completely understand the advantages of the commercial car and will assist in economical maintenance.

The shower of praise with which the first number of the C. C. J. was received, was beyond our greatest expectations, and we are embarrassed for want of adequate expression to thank our readers for their many kind words.

Our first number seemed to meet all requirements so fully that we are convinced that the plans we have laid for future issues are in the right direction, and cannot fail to fulfill the expectations of the user, seller and maker of commercial cars. We intend that our future numbers shall be even more comprehensive and valuable, as we have many original ideas in process of development.

It has been said that a bird never picks at a bad cherry. Competitors never find fault with a poor product. This comparison is intended to show the C. C. J. has not only been well received by manufacturers, dealers and truck owners, but by other publishers.

A good thing will always win on merit and what obstacles will be thrown in the way of the progress of the C. C. J. will be but as driftwood on the tide; for we are determined that this magazine is to be the greatest of its kind in the world.

The reasons for this is that its publishers have: 1st—the determination; 2d—the capital; 3d—the facilities and 4th—the willingness to lose money until the commercial car industry shall be built up to a point where it can adequately support a publication of exceptional merit.

In conclusion we wish to ask one thing only of the truck user, maker and seller: "Watch us Grow."

THE BONUS SYSTEM FOR DRIVERS: WILL IT TEND TO PROMOTE BETTER SERVICE?

Experienced users of commerical cars are agreed that one questionable feature of operation is the driver. One owner who has had to do with all types of operators, good, bad and indifferent, makes the assertion based on his knowledge of the situation. "The driver is 75 per cent. of the commercial car problem." A careful analysis will show this statement to be correct. There are some drivers who will speed anyway, especially towards the end of the day when the one important consideration is to quit with the clock. Working with the clock is not without good features, but the driver who would double the speed of his car rather than work a half hour overtime is not only producing undesirable conditions for his employer, but is ruining his own chances as well. Wise employers have a system of doing business and when a new man is taken on, his past record is very generally known.

The bonus system is one much discussed by owners of motor trucks as tending to promote better service. In some cases it might reasonably be expected to work out very well. But, if an operator is paid good wages has not his employer a right to expect good service, considerate treatment of the car and tires, by the driver? It is but reasonable to assume that he has. But of course the dollar has its influence and an "extra" in the pay envelope at the end of the week may have a good effect, the promotion of better service. So well

convinced is a large user of cars that the bonus system will result in improvement, that his drivers will henceforth be treated accordingly. It is estimated that so much should be set aside for each of the cars employed as a repair fund. Now it is the intention of this concern to divide with the operators of the vehicles, and there are really some interesting features for the drivers in connection with this offer.

The company referred to, the largest in the world in its particular field decided on the innovation, not so much because of poor service heretofore obtained, but rather with the idea in mind of curbing some of the men in charge of gas equipment, who had a habit of coming down hill at 35 miles an hour or thereabouts to the detriment of the mechanism of the trucks. It is known definitely what it costs to maintain each car in service, and if a certain sum is set aside as the probable amount needed, and if the driver by more careful operation spares the car and reduces the repair cost, he will himself realize a good share of the amount set aside for the purpose. If the car under his operation costs too much, it would mean his dismissal, on the other hand if he lowers the figures he materially increases his income. This idea is another phase of the co-operative plan which for many years has worked successfully with this concern and its employees.

From this particular service the inference may be drawn that the idea is practical and is not the result of an impulsive idea, but is indeed one phase of the problem of maintenance, carefully considered. In a sense it is not so much a question of right or wrong as the realization of satisfactory service. Although, in a sense, it borders on the abominable tipping system, yet, it is certain to improve conditions. To say the least it is worthy of the consideration of users who have big repair bills every month.

A WARNING TO THE TRUCK SALESMAN

It is human nature for the truck dealer to try and show off the utmost possible in his vehicle when making a demonstration, but this very tendency to go to extremes when demonstrating the possibilities of the motor truck has already caused trouble and will undoubtedly cause much more trouble before the dealers recognize the error they are making.

When a dealer says he will "show" the man from Missouri that his truck is the best in the world, he usually has the spirit which leads to doing "stunts," and forces it to the absolute limit of its capacity. What is the result? Naturally the purchaser is led to believe that the work the truck has just done is simply an everyday performance, when in reality a daily service such as that which the over-zealous agent has just imposed upon the truck would very soon relegate it to the scrap heap.

To be more specific, both the dealer and the prospective purchaser are in a mood to see just how much the truck will do without going to pieces. The purchaser says, "Now, here is this pile of merchandise, let's see you take it to Cranberry Centre," or some other equally out of the way or distant point. In fact, the prospective purchaser is skeptical and would rather like to see the truck come to grief carrying the heavy burdens which ordinarily require his entire force of delivery wagons to handle in a day. The dealer is equally anxious to show that the truck can do it and very often without even a protest loads on 50 per cent. more than the capacity of the machine.

Of course the truck starts off all right and very soon the enthusiasm of the demonstrator leads him to speed her up as fast as possible in order to get back sooner than the prospective purchaser is looking for him, just to show how very much faster a truck is than horses. Things are pushed to such an extreme that often the third and sometimes the fourth loads are carried within the day, owing to the anxiety of the dealer to show what a wonderful product he represents.

After the sale has been made, it is not surprising that Mr. Purchaser immediately does the same thing, overloads the vehicle, pushes it at top speed over all kinds of car tracks and pavement, and even calls down the driver as being incompetent if he does not cover as great a distance each day as was made by the machine during its demonstration. Is it any wonder that after a short period of such strenuous service, parts begin to break, tires wear out, and the mechanism generally begins to show the effects of the excessive speed and overloads? The purchaser is usually in blissful ignorance of the fact that he is shamefully abusing the machine and very little can be said by the agent after he himself has set the example.

It would be far more wise on the part of any automobile truck salesman, to demonstrate in such a way that the purchaser, in emulating his example, will at least give the truck a fair chance. It is always best not to overdo the matter on a demonstration, keep well within the bounds of the truck's ability and let the purchaser be pleasantly surprised after the purchase is made, to find that on occasion the truck is capable of even greater achievement.

If during demonstrations, 50 per cent., 75 per cent., and even double the rated load is carried and at abnormally high speeds, it must be expected that the purchaser will do likewise and that he will be dissatisfied at finding that the machine will not stand up under this kind of use. There is a lesson here which each commercial car salesman should take to heart.

MOTOR CARS INSTEAD OF RAILROAD

Giving up all hope of obtaining concessions from the railroads, the merchants of Lees (not Lee's) Summit, Mo., a small town thirty miles east of Kansas City, have inaugurated a motor car line for the handling of passengers and fast freight. Two thirty-two passenger cars and two twelve-ton freight trucks were put into commission on the morning of April 3. They make trips once an hour between terminals, and passengers are given transfers on Kansas City street car lines which entitle them to ride to any point in either Kansas City, Missouri, or Kansas City, Kansas. The freight is assembled at a depot for delivery to the trucks. "We do not propose to leave much freight for the railroads to handle," says the manager of the line, "we will operate the year 'round and we will make better time than the railroads can possibly make. This is made possible by good roads and high class motor cars. It will now be possible for our merchants to order goods in Kansas City and have them in their stores, thirty miles away, within two or three hours. The railroads have forced us to discover the superior advantages of motor transportation."

The Seitz Motor Truck Company has opened a distributing station in Kansas City and from this point has begun a campaign covering the territory from the Rockies to the Missouri River and from Nebraska to the Gulf.

A Suggested "Nesting System" as a Solution of the Department Store Parcel Delivery Problem

BY E. S. FOLJAMBE

ERCHANTS who are already using commerical cars in their delivery service have found that existing systems must sometimes be greatly altered to meet the new conditions brought about by the use of self-propelled vehicles. Monied business firms that are now entering new buildings are fortunate indeed in the fact, that they can plan to meet these new conditions instead of having to gradually adjust and readjust the old order of affairs. A notable example of a modern installation is that of Gimbel Bros.' new store in New York City. This firm has started out on the modern method and has no horses whatever. Under such ideal conditions the arrangements for delivery within the store can easily be suited to meet the special requirement of motor trucks.

With the idea of assisting those who intend to install a motor delivery service this article has been written. The methods herein suggested can be adopted, not only by those who are fortunate enough to build with this idea in view, but can also be made use of by department stores and others without materially changing the already existing methods for handling parcels within the stores.

The Nesting System

Just what is meant by the "Nesting System" as applied to the delivery of goods by commercial trucks may not be thoroughly understood. A brief explanation is therefore needed. The Wanamaker stores and some others have found it of advantage to use a crate or lattice work inner body which can be slipped, after being loaded, directly into the body of a motor truck. By the use of such "nests," as these inner bodies are called, it is possible to keep the vehicle continually in service delivering the goods in one nest while another nest is being loaded, to be taken on as soon as the vehicle returns. This article deals then with the use of such inner bodies and outlines the possibilities of an extended service developed and based upon the use of these nests and motor trucks.

Time That Might Be Saved

It is believed that the liberal use of inner bodies combined with a suitable number of large and small commercial vehicles will greatly facilitate the speed with which department stores and other mercantile establishments can deliver the large number of small parcels which they are called upon to move. Much time is now lost by duplicate handling of the bundles, by packing them into hand trucks and unpacking them in order to pack them again in the wagon. Much of this work is done on the sidewalk in front of the store, where the bundles are strewn around, soiled and often damaged by rain before the driver can properly arrange them in the wagon. As a rule the ordinary driver makes but a rough assortment or arrangement of the packages in his first loading. It is then found necessary to stop when his territory is reached and re-arrange or re-route a large part of his load, again the bundles are placed on the sidewalk and much of the same performance that was gone through in front of the store is repeated again on the suburban street corner. It is noticeable that the places selected for this re-arrangement of packages are apparently, whenever possible, in close proximity to a saloon, much time is thus wasted. If it were possible to arrange at once the loads in an inner body, this sidewalk performance could be entirely dispensed with. By using several inner bodies each could be loaded and when filled would constitute the entire load of a small truck. If now several of these small inner bodies could be delivered in quick time by a larger truck to suburban stations, small machines could each immediately take one on forming its load and cover its respective route without the necessity of rehandling the packages. It is understood that to lay out such a system so that it will be applicable to all kinds of stores is an utter impossibility. What is here outlined is therefore made merely as a suggestion, which can be worked out to cover the individual needs of any specific case by those in charge of the delivery service. It is not intended that this article shall deal with the methods now employed within the store for handling the parcels except to just the extent that this part of the work must be arranged to fit into and facilitate the work being done by the trucks outside of the store.

The Suburban Station

The suggestion is herewith made that a series of sub-stations be arranged at suitable points in the suburbs; each of these sub-stations to be the central point from which small delivery wagons will radiate in covering their respective territories in that portion of the city. Running from the main store there will be used larger commercial cars capable of considerable speed. Each of these machines will, carrying as its load three nests each filled with parcels, take care of a specific route covered by a delivery wagon from the suburban station. The duties of these larger trucks will be simply that of carrying these loaded nests to the suburban stations and conveying the empty nests back to the store, in as quick time as possible.

In the accompanying illustration the map of the City of Philadelphia is shown with a series of sub-stations indicated. From each of these sub-stations A, B, C, etc., radiating lines are drawn and numbered; these indicate merely in diagrammatic form that from the sub-stations there will be delivery wagons covering these numbered routes. Where the territory is more or less congested with houses and well built up, a larger number of wagons will be required as indicated by there being more lines from these stations. For some large stores, double the number of routes shown, might be required. It is understood, of course, that a large number of routes will be served by trucks running directly from the main store, these routes are suggested by the lines 1, 2, 3, 4, etc., radiating from the store at the centre of the city. It is not the intention at this time to outline in detail how each wagon is to cover its route, but simply indicate roughly the neighborhood covered by means of a median line through the district.

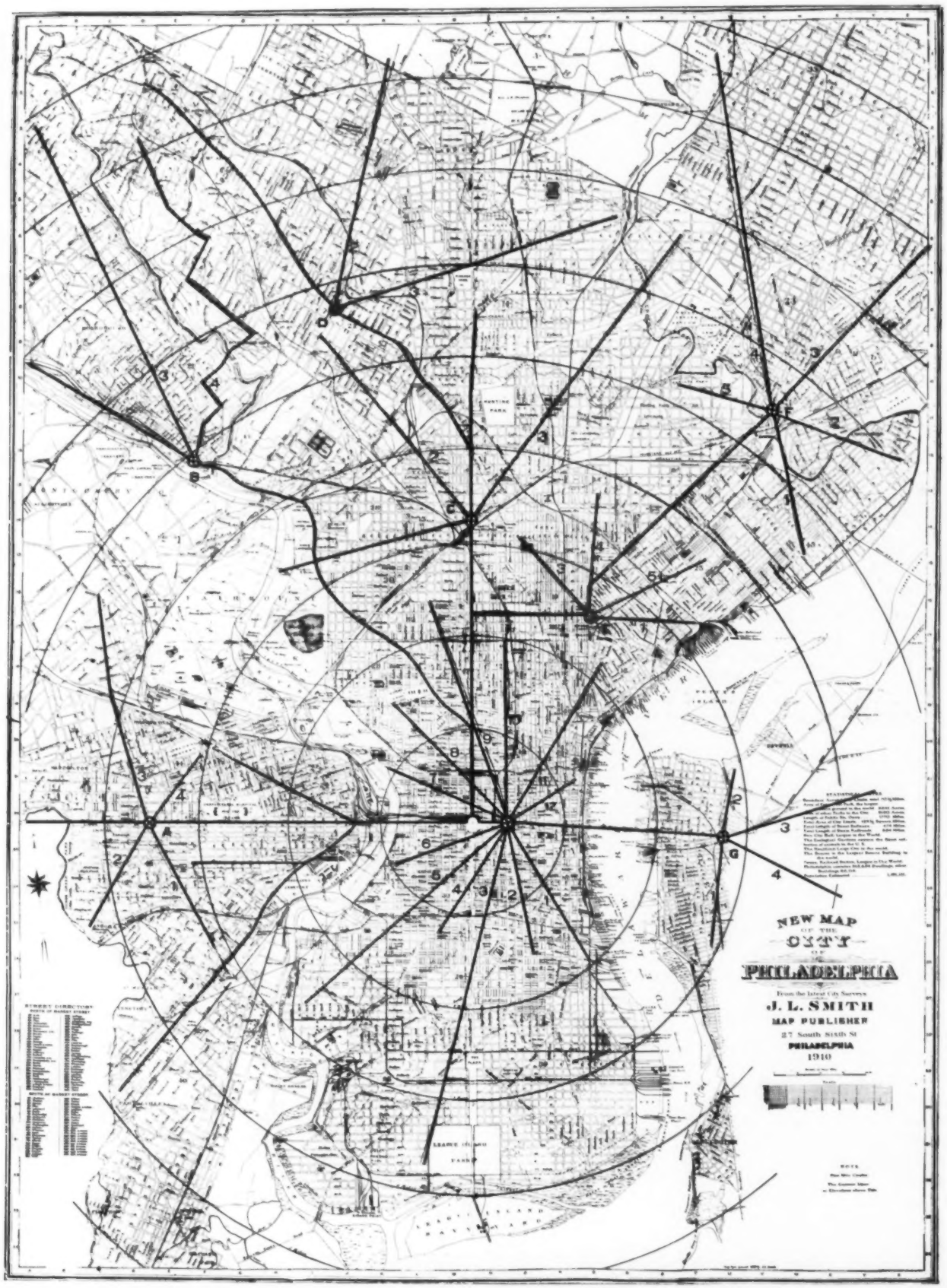


Fig. 1. Map Showing Method of Routing When Employing the Nesting System

The Belt System

To make the system here outlined more clear, it will be necessary to go within the store. At the present time the more progressive stores use what is known as the "belt system" for conveying parcels from all parts of the store to the place in the basement where they are divided into routes, packed in hand trucks, wheeled on to the elevators by the drivers and taken to the wagons. This belt system extends over a large part of the store, receiving the bundles from shutes and conveyors and carrying them to a central point where the belts come together or cross. At this point are stationed dispatchers, who are expert as to the districts covered by the various routes. Faster almost than the eye can follow them, they grasp the parcels, glance at the address and immediately mark the bundle with the number of the route for which it is intended. "Specials," "C. O. D.'s," and "Charges" are also separated and placed on sub-belts to be conveyed to the proper places. A main belt receives, however, all the ordinary bundles, and stationed beside this are boys who take the bundles and throw them on a sort of bench with vertical partitions, called the "dividers," each space on the dividers is numbered and represents a certain route. Back of the dividers are stationed men who are known as sheet-writers, whose duty it is to take the bundles from the divider, place them into cages which are numbered according to routes and make a list of what is placed in the cage. In Fig. 1 is shown at the left the backs of a series of such cages in an up-to-date department store. The cage doors are opened by the drivers after being released from the inside by the sheet-writers. This view shows a driver loading a hand truck, and below to the right, is seen another driver pushing the hand truck on to the elevator to take it to the wagon on the street.

Distributing Packages Directly Into the Nests

Fig. 2. This view shows a suggestion for the arrangement of the travelling belt, which is moving in the direction shown by the arrow: of the dividers back of the boys and of the route shelves; lined up back of these are the nests ready to be packed by the "routers." The nests are then wheeled directly to the truck, three to four composing the load, and are carried as rapidly as possible to the suburban stations.

As It Might Be Done

In order to make as few handlings as possible, several changes are suggested. In Fig. 2 is a sketch showing a general view of the belt conveying the parcels in the direction indicated by the arrow. This belt of heavy canvas is about three feet from the floor, about three and one-half feet in width, and runs on wooden rollers. It is usually entirely cased in beneath as illustrated. The boys, as usual, pass the parcels to the dividers, but instead of the usual bins with stalls beneath for the small hand trucks, an arrangement as shown in the sketch is proposed. For each route, there would be a series of shelves extending from the floor upward, these shelves being arranged with their ends toward the dividers, and touching the dividers, thereby saving about three feet of space, which could be added to the space occupied by the shelves. These shelves would face each other as shown and between each set of shelves would be a man who takes the place of the customary sheet writer. In large stores one man might be required to each route, while in smaller establishments one man could take care of two routes or even more if there were not many packages. This man, let us call him "router," takes the packages from the dividers, say for route No. 1, Station A, and roughly divides them according to the part of the route to which they are to be delivered. Thus, half of the top shelf may be devoted to the part of the route first reached, the other half to that next reached, the second shelf in the same way, and so on to the third and fourth shelves. In other words, the router would be so expert on the one, two or three routes under his charge, that he could instantly place a bundle on the shelf representing the part of the route to which it must be delivered. At the rear of each of these shelves would be placed the nests, each of which would eventually form the complete load either large or small of one of the suburban delivery wagons; three of these nests, as before stated, forming a complete load for one of the transfer trucks running between the store and the suburban stations. The router, at a set time, if deliveries are made on schedule, would look over the packages, on the shelf representing the last end of the route in question, and actually arrange those parcels in the nest in

the order in which they will be reached, numbering them as they are placed in the nest. As the bundles which will be reached last are the first ones placed, in order to number them as they will be reached, it would be necessary to know the total number of bundles. This however, would require the router to count all of those on the shelves. It would probably be better therefore simply to number them in order as they are placed into the nest, the drivers understanding that the parcels are to be delivered in the reverse order, that is, the highest numbers first. By this arrangement, the parcels

Drivers Collecting Parcels for a Load

Under each cage is a space for a hand-truck, and the parcels from the cages are deposited in the hand-trucks by the drivers, wheeled to the sidewalk and again rearranged in the wagon, thus losing valuable time.

can be written on the sheet as placed into the nest if sheet-writing is employed. If not, this time can be saved. Any bundles out of order or missed will be immediately noticed as the entire contents of the cage bears successive numbers, giving a ready means that does not now exist, of locating any parcels shaken out of place or missing.

Objections will be made that it is impossible for any one not actually delivering the goods to arrange them in the best of order for delivery. This, however, is a fallacy. The very expertness of the dispatchers who must have a knowledge of the exact boundaries of every route of the entire city, sometimes as many as 125 or 150 is a proof that it would be a comparatively simple matter for the same individual or even one less expert, to become thoroughly familiar with every detail of two or three routes. In fact, these routes could be so systematized that time could actually be saved by the man on the road in covering them. Route cards always before the router, would clearly show the best possible course to follow in covering the district. Again, it may be objected that the parcels cannot be packed so that they will retain their arrangement, but this objection, although partially true, would not seriously inconvenience the driver, especially as the packages would bear consecutive numbers. A good packer can arrange parcels so securely that they will not be badly out of place upon reaching their destination at the suburban station. Furthermore, the numbers in large crayon figures of distinctive color would clearly indicate to the driver any such derangement. Again, it may be objected that the inner bodies would, together with the shelves, occupy too much space in the store. This in many instances might prove a serious objection, but just as with other arrangements which prove of value, ways and means will be found in the individual cases to take care of the installation. Actually, the space occupied by this system need be very little if any greater than that already required. The nests need not be over 4 or 4½ x 5 x 5 feet in height and the arrangement of the shelves running clear to the ground, and the doing away with the alley usually occupied by sheet-writers will, to some extent, offset the larger nests.

A Great Saving of Time

With such a system perfected, there would result a great saving of time. At present the horse, wagon and driver, one might say, are

Driver Pushing Hand-Truck Onto Elevator

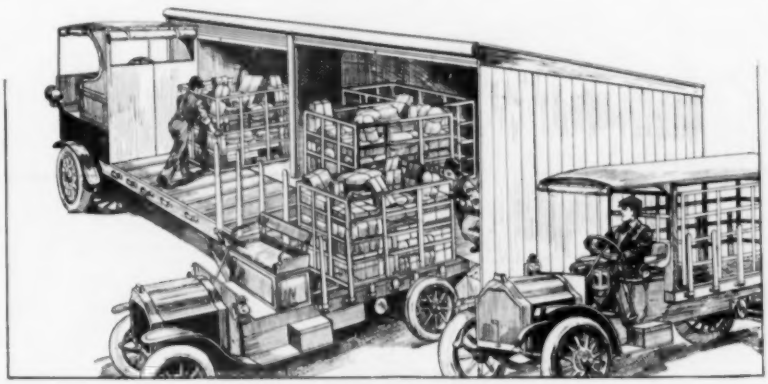
It requires several hand-trucks to form a load and the parcels are usually laid out on the sidewalk while the driver makes his load into the form most easily delivered.

required during the time of loading, the entire outfit being idle as far as effective service is concerned. With the "nest system" the trucks would be kept continuously on the road, and the driver would not spend hours fooling around in the wind, rain, sleet and snow, endeavoring, under the most adverse circumstances, to rearrange his load. The sheet-writer at present has to handle every bundle and could at this time with very little additional labor place it into its proper shelf, instead of simply into a bin. The handling of the packages by the driver from this bin into a hand truck

would be replaced by this same handling of the packages by the sheet writer, but subsequent handling of the packages by the driver, except for delivery, would not have to be made. As before stated, however, the various details of such a system could be altered to suit the particular conditions in any individual store, the above being simply a general suggestion.

The Sub-Stations

The sub-stations, wherever possible, should also form the suburban garage for the delivery wagons operating from that point, but where this is impracticable, a small platform of the proper height for transferring the nests from the trucks would be all that is necessary. With the garage properly located, this platform could constitute one side, or there might be more than one platform to facilitate the loading and unloading of several machines at one time. In Fig. 3 is suggested such a loading platform covered over to protect the goods from the weather and fitted at the front with sheet metal, roll, fire proof doors which could readily be closed and locked. In most cases an attendant should be stationed at this point, as occasionally the delivery wagons might not be on hand and nests of goods might have to be held pending their arrival. Although locked, of course, these represent a responsibility to the store, being sold articles. In the illustration the large truck for clearness is suggested as uncovered and having a stake body, but covered bodies could be used. If open wagons are used, which might be an advantage in some instances, rain proof tarpaulins should be employed to cover the nests. The nests are fitted on the underside with skids, each of which has set into it substantially built rollers by means of which they can be wheeled across the sidewalk or at the store loading platform which should be similar to that of the suburban stations, or by means of which the nest can be readily handled on the platforms. Each nest would occupy its definite place on the truck, and there could be metal ways on the floor of the truck to receive the rollers, making handling easy. The small truck would simply back up against the platform and the drivers could roll on to them or into them if covered, the loaded cages, leaving the empties on the platform. Of course, it is understood that the sides of the large trucks used are to be so arranged that the nests can be rolled off and on in the quickest possible time.



A Suggested Suburban Station

At this station, which is the proper height so that the nests can be wheeled directly from the truck to the platform, the various suburban delivery wagons take their nests, each forming a complete load, and in turn leave the empty nests to be taken back to the main store, by the transfer truck.

This method which we will designate as the "nesting system," offers unusual possibilities for the future rapid handling of large numbers of parcels, and is capable of many modifications to fit it for use in special kinds of delivery. The development of the best methods are, of course, left to the judgment and intimate knowledge of those familiar with the working conditions in each instance. The methods herein outlined are given simply as a general suggestion to convey some idea of the possibilities of the "nesting system."

SAURER TRUCK ON LONG TRIP

A Saurer five-ton truck, nicknamed the "Pioneer Freighter," left Denver, March 1, bound for San Francisco over the road with a load of three tons of lumber and camp equipment. The big truck is being sent across by the American builders of the well known Swiss machine, The Saurer Motor Co., to demonstrate its ability to carry a paying load through under the most adverse conditions, and is of particular interest to mining and ranching companies in the far West. On reaching San Francisco the return trip will be made over the northerly trail through Ogden, Salt Lake City, Denver, Kansas City, St. Louis and Chicago to New York. The Saurer truck is being piloted by A. L. Westgard, who holds a special authorization from the U. S. Department of Agriculture, Office of Public Roads. Mr. Westgard is an expert topographer and will report on road conditions, beside compiling other data that will be of value to the various government departments and particularly the War Department, owing to the great distance that many of the military reservations are located from the railroads.

Dayton, Ohio, has just installed a new ambulance for the use of the police department.

The Indianapolis, Ind., Police Department are just adding their third automobile patrol wagon.

The Shelby, Ohio, Council have passed an ordinance to purchase a gasoline motor combination fire wagon.

Buffalo, N. Y., has advertised for proposals to furnish the city with three motor ambulances for the Ernest Wende Hospital.

Minneapolis, Minn., has advertised for proposals to furnish two 2,000-lb. commercial cars for use by the Water Works Department.

The majority of voters in Saugus, Mass., recently decided to authorize the purchase of a motor hose and chemical wagon, at a cost of $5,000.

Richmond, Ind., will probably have a motor patrol wagon and a motor chemical truck. The Mayor and City Council seem favorably impressed with replacing the present equipment, which is becoming worn out, with motors.

Motor Truck Tire Deterioration

BY WILLIAM J. JOHNSON

NUMEROUS reasons may be set forth for the rapid depreciation or wearing out of commerical car tires, due largely to abuses which may be laid at the door of the consumer, or at least at the door of his organization. There is much in knowing how to do anything, the man with the knowledge has a big advantage over the one who has not. Common sense is a tremendous factor in the use of commercial cars and tires and by the exercise of it service may be bettered.

It must be remembered that no tire, regardless of how well made or the quality of the materials employed, can long withstand abuse. The major portion of truck tires in use today are abused shamefully, and the sooner the man who foots the bills realizes the fact, the sooner will his service become what he hoped at the outset it was going to be.

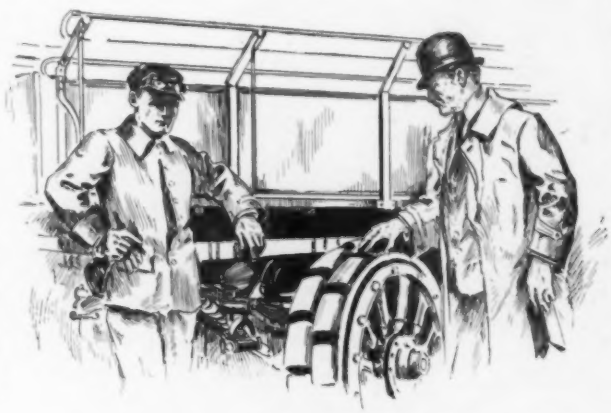
User Public Educator

The user of commercial cars and tires is a public educator, he supplies, though he may not be aware of it, unless he is of the thinking sort, much of the information desired by prospective purchasers of trucks and kindred equipment. The user may never utter a word as to the kind of service he derives from a given tire or truck, but anyone who really wants to know has merely to keep his eyes and ears open and he will know. The tire manufacturer may laud certain of his products, but, it remains for the commercial car user to educate the public as to whether the manufacturer in his statements is dispelling fact or fancy. The maker may resort to all sorts of schemes for exploiting his product, but after all it is the private and individual commercial car users who provide the real data. The individual in his service has something real, the service is actual, the manufacturer in many cases confronts a different proposition since trained men very often try out the equipment. There's the difference.

Necessity of Individual Judgment

The uninitiated user of commercial cars and tires must operate his equipment for a certain length of time before he is satisfied as to the service probably to be derived from his tires and car, statements and data of manufacturers notwithstanding. It must be borne in mind that though the commercial car is comparatively new, those who enter the field now, demand more than purchasers in the past. They must know to their own satisfaction that given tires will provide specified service. Manufacturers may tell a prospective purchaser that tires will do this or that, but the business man seeks his own information and generally acquires what he wants in this regard.

Since the interested observer may have installed a commercial car to increase his revenue through a more efficient delivery, he must of necessity keep a close watch on his tire equipment, and in due course he knows whether he has had service or the manufacturers owe him something by way of an adjustment.



Tires Should be Inspected Each Night

The life of a tire depends largely on the quickness with which small cuts are attended to.

It is not infrequently the case that many users of cars, after having been satisfied that the service is superior to horses, allow their interest to wane as regards their tire equipment. Tire bills are presented, and paid, and sometimes considered as a necessarily heavy and unavoidable expense. Discretion in this direction is imperative, otherwise the user does not know whether or not the tires are wearing out too rapidly for his service.

Doubtless the user of tires has been visited by a salesman after his installation, as a purchaser of commercial car equipment and his entry into the field has been duly noted by all interested. In the course of an ordinary conversation he has learned something from the salesman and it renders him the more zealous of his trucks and then he is better equipped for the determination of proper tire service. Possibly he has learned through the salesman that his tires are too small, this sort of thing has occurred time and again and it simply bears out the statement of a majority of makers, that most of the tires applied are too small. That part of it has to do with the manufacturer of the vehicle of course, but the expense involved must be borne by the user.

Responsibility of the User

Commercial car tires are costly and cannot be neglected, and the owner and user of tire equipment can hardly be said to be devoid of responsibility in this regard. He cannot afford to ignore the fact that tires must be cared for if good service is expected, that they demand just as much inspection and care as any branch of his business, and that he not only owes it to himself, but to the maker of the tires, the car and the prospective purchasers as well, to treat his equipment with due consideration.

Common Sense System Necessary

To fully realize his responsibility in this regard the user must have a system of care and repair, the better the system the more may be expected of it. If he employs one car or twenty, the situation is the same, he must do things right. That he may obtain almost any desired service is certain and it all rests with him. At the end of the day when the cars come in the tires should be gone over, the driver of the vehicle in his general report on the car should make a statement on the record card as to the tire conditions and the superintendent of the garage or whoever is in charge should see that the driver does so. There must be whole

View of New and Old Solid Tire

This cut shows how the solid tire grows old gracefully and wears down almost to the rim before being useless.

hearted effort, not slip shod apologies for method. The owner should keep an exact record of the date of purchase of tires, application to the rims, when repaired, cost of repairs and the mileage total when the tires are replaced by new equipment. Drivers should be called to account when tires wear out too rapidly.

There is imperative need of a close follow up system on tires, and it is to be noted that in those services where excellent results are being obtained at present, things are done in a business-like manner, the users know what tires cost. For the benefit of the commercial car user who has no system, but is zealous to improve his service, we mention a simple method which will be useful.

How to Keep Track of Tire Service

A card index, since it is a flexible device, is well adapted for the purpose. An ordinary 3 x 5 card can be secured at slight cost with various classifications. The card should be headed by the words, "Tire Record" in the event of the owner preferring to keep the tire account separate from the general car account. If one card is used for both the car record and tires, there is ample space on each side of the card for the two general classifications. The driver's name should be noted as well as that of the car and the number assigned. There should be individual notations of all four tires, date of purchase, when repaired and replaced with the mileage and such other simple information as would improve the system. In connection with the card record there should be used a day card or similar recording device to note the departure of the driver and his return and his report on the condition of his equipment as previously mentioned. We may assume for example, that Smith drove a five-ton gas car fitted with a complete set of new tires September 15th, last. Smith is a good driver and knows his business. But by the simple record he has gone through this set of tires under the same conditions, in less time than a previous set, the total mileage is so much less as to give rise to speculation. It is by a record of mileage that the user actually knows and after all that is only fair to the maker.

Tire Makers Must Observe Users

Tire makers should follow up the tire in the hands of the user. This is accomplished through traveling representatives, branch houses or agencies. The maker must inculcate the idea that system is everything where good service is expected. Then too, the tire maker, the truck builder and the user must work in harmony, for upon their attitude the public bases its opinion.

Makers Alive to Situation

The tire builders are keen for improvement and know that many users do not care for their tires properly, are constantly striving to produce something that is better and should be given credit for the fact. Very naturally makers of tires like builders of trucks, differ as to the proper construction, but that is to be expected and the fact remains that while they are trying to help along the user he should reciprocate in the most effective manner by, "helping himself."

Motor Governor as a Tire Saver

Since high speed has a deleterious effect upon tires it remains that some effective means must be devised for holding in check the driver prone to speed, this fact is now more realized than ever.

Truck makers, that is some of them, realize that drivers are unknown quantities, and to curb their desires equip the motors with governors. This, of course, holds the speed down

TIRE RECORD

CAR NO. _____

DRIVERS _____

	FRONT		REAR	
	LEFT	RIGHT	LEFT	RIGHT
DATE OF PURCHASE				
MAKE & SIZE				
TOTAL MILEAGE				
DATE OF REPAIRS				
NATURE OF REPAIRS				
DATE OF REPLACEMENT				

REMARKS _____

and increases the life of the tires. In practically every case of which the writer has knowledge, unduly rapid wear of tires has been traced, most always, to excessive speed and for the drivers' fun the owners had to spend dollars.

Educating the Driver

The driver is a tremendous factor in the life of a commercial car and the tire equipment. The most experienced users, to put the driver in figures, estimate that he is 75 per cent. of the commercial car problem. Therefore why should he not be considered seriously? Why should he not be educated to such a degree that he is zealous of the vehicle he drives and

of the welfare of the man who hands him a pay envelope on Saturday? If he takes an interest the service will be improved. He will be the more careful in going over bad spots in the road. A large percentage of cars are recklessly driven over bad spots. The driver must be schooled by his employer, or the latter should at least see to it when he employs him that he has had previous experience and knows how. If a driver knows that he is to be called to account he will exercise better judgment in the operation of his car and the result will be reflected in the longer life of tires. By all means he must be made to understand that tires cost money.

The relations between the owner and his driver should be fostered to such an extent as to bring about wholesome conditions, there should be hearty co-operation.

Improved Roads Will Increase Tire Life

Another reason for rapid wear of commercial car tires is the abominable condition of the roads in the vicinity of the river docks, freight stations and in the shipping districts. The need of improved roads is as imperative in the business sections and shipping districts as in the residential portions of the big cities. The commercial car is a developing factor, it must be accepted as such. In the early days road improvement was furthered by the bicycle, later by the pleasure car and, for the motor truck the real solid satisfactory method of transportation, greater advances must be made. With an acceptable system of main arteries from one town to another, the commercial car operated under a minimum of tire expense will to a degree repeat the history of development which followed in the wake of the railroads.

NEW HARVESTER IN KANSAS

When the Kansas farmer started in to buy touring cars, he surprised the world. The makers of automobiles discovered that there was one state on the map whose agriculturists were not "hayseeds" but business men. One of the surprising features of the trade years is the rapidity with which the Kansas farmer, who always does things on a big scale, is awakening to the possibilities of the motor truck. Not only is he buying motor trucks, but he is trying his hand at making them. The latest invention in this line is that of Winifred Jacobs, who gets his mail at Hutchinson. Mr. Jacobs isn't exactly a farmer, but his interests are altogether with the tiller of the Kansas soil. His invention is a combination motor truck, harvester and thresher. The first of the machines is to be in operation by June when it will begin work in Oklahoma. It will follow the wheat harvest north to the Saskatchewan district in Canada, after which it will return to Hutchinson, Kansas, to be exhibited at the fall fairs. It will make every foot of the trip by its own motive power.

There is already in use in California a combination harvester and thresher, but it is drawn by horses. The Jacobs machine will furnish all its own power and will run in the muddiest wheatfield, cutting the grain, threshing it and distributing the straw in its wake for fertilizer.

The Jacobs engine, protected by patent, is built upon the plan of the engine which drives the ordinary motor car. The first clutch operates the threshing device, the second the cutting mechanism and the third drives the combination car ahead. Complete, the machine is twelve feet wide, and twenty feet long. It has a chassis resembling that of a standard 50 horse power motor car, and its engines will produce 50 horsepower. It has two drive wheels five feet in diameter with twelve inch tires, and three wheels forty inches in diameter with eight inch tires. The weight complete is five thousand pounds.

It is claimed for the machine that it will reduce the cost of harvesting to an astonishingly low figure.

"A farmer and his boy using one of these machines can harvest a three hundred acre field in less time than it can now be done with a small army of men," says the inventor. "I can make and sell these machines for one thousand, five hundred dollars, and enough can be saved on a three hundred acre field to pay for the motor harvester in a single season." The Hutchinson Commercial Club is now considering a proposition to build a factory for the production of the motor truck harvester.

A Commercial Car City

Hutchinson, Kansas, has 16,364 people and is said to use more commerical cars than any other town of its size in the United States. It has a motor car fire department, its flour millers use motor trucks almost exclusively, and the Hutchinson grocer or dry goods merchant who does not use a gasoline driven delivery wagon is considered behind the times. The bottling works, the feed stores, a hardware concern, all have their service cars. The great salt works, for which Hutchinson is famous, are of course, among the users of motor trucks. Judged by its motor trucks and service cars, Hutchinson presents the appearance of the ordinary city of 100,000.

SAMPSON MAKES OVERLAND TRIP

Chicago, Ill., April 4—A Sampson four ton truck loaded to full capacity and driven by W. B. Ingwersen, arrived here last night after completing a test run of more than 200 miles, starting at Rock Island and including the cities of Princeton, Peru, La Salle and Joliet. The truck left Rock Island on Friday, March 30, to cover the northern part of Illinois and demonstrate its value in heavy transfer work in rural districts.

Stops were made in Princeton, Peru and other cities to permit business men and shippers to become acquainted with the truck, requests having been made by merchants in those cities to include them in the route. The interest shown by these business men when they heard of the proposed run is typical of Western enterprise and progressiveness.

ST. LOUIS PLANS MOTOR PAY CAR

An ordinance to equip St. Louis, Mo., with an automobile pay car, in which representatives of the city treasurer will travel to the city institutions and other outlying districts to pay off city employees, was introduced into the City Council recently. The automobile is to be assigned to the city treasurer's office, and is to be equipped with a stationary strong box for safeguarding the funds transported and stations for armed guards. An appropriation of $4,000 is carried by the bill.

Taxicab Service Organization and Maintenance

BY D. R. HOBART

PART I

THAT the proportionate increase in numbers of taxicabs used in not only the largest but the lesser cities of this country for the year 1910 was much below that of preceding years is unfortunately only too true, but too much capital has been made of this fact already, in many cases without giving or seeking for the causes which gave rise to the failures of a number of the more recently organized concerns and the curtailment in rolling stock of others. With the realization that a taxicab service is a special undertaking involving a number of incidental details found in few other lines although readily enough conducted when properly organized, has come a firm, substantial condition of affairs in this portion of the industry at present, which augurs well for the present year, in which a substantial increase may well be expected.

The Reasons Why Some Failed

The chief causes which militate against the successful conduct of a taxicab service as a business are: unsuitable vehicles, defective organization and haste, the latter both in getting the service started and in endeavoring to realize fine results in respect to dividends, etc. As regards the initial capital, it is not within the scope of this article to treat on this point, which must be left to the organizers themselves.

Requirements of Cabs

In obtaining cabs for a given service, the following requirements are to be fulfilled: reasonable initial cost, sufficient power, a long life under the trying conditions of taxicab service, adaptability to ready repair, and lastly, a substantial and comfortable body construction. To these may be added mobility of the cab, but as but few concerns attempt to employ long wheel base chasses in their service, it is presumed that the cab to be chosen will be at least able to turn in a 30 foot street without reversing.

The question of initial cost is the most important, as on this foundation amount expended in "rolling stock" depends in great measure the possibilities of earning dividends or not. But it must not be considered the only question; no matter what the price, if too much wear and tear on the cabs results, from lack of sufficient power or from poor construction, what may be gained in receipts will be eaten up by repair charges. The fact that there is little adaptability to ready repair will serve to increase the expense, so that the concern will after a time be obliged to sustain heavy losses or retire from business. Neglect of this latter point was one of the main causes of re-organization of one of the largest taxicab companies in this country about two years ago.

Experimenting With Various Types

Unless the prospective concern is willing to adopt a "stock" taxicab model from one of the companies manufacturing such a product, and relying upon the performances of similar vehicles in cities having similar conditions of streets, service, etc., it will be better to take on trial machines from a number of makers, giving them at least six months, say 150 days, with a minimum of 55 to 60 miles per day, should the prospective service call for that distance at any time. In this test, any weak points will surely appear, and accurate information as to reliable performance will be obtained. This to most business men will appear too conservative, and claims to the effect that entirely too much time will be lost will be made, but on the other hand, the cabs are in service, and are earning for the company, and when the choice is made, there is an assurance that in this respect the concern will be well able to do business for over a year from the time that the selection was made. As to precedent, one of the largest New York companies experimented with five types for over six months before the final choice was made, using the cabs at their busiest stands in order to give the utmost test possible, short of destruction. In another instance a New York concern started with five rented cabs, using them until a satisfactory model was found, when the whole were replaced by five new vehicles, all of one type.

If the "stock" model as previously stated is not chosen, it would be better, if possible, left to an experienced man unconnected with any manufacturer rather than to the officials of the company, who usually are experienced in other lines of business, and are inclined to look to the first cost only, to the detriment of the organization in all too many instances.

As regards the actual cost, this will be in the neighborhood of $2,000 per cab, fully equipped, for a four cylindered motor, with sliding gear transmission and comfortable landaulet body. The power will ordinarily be about 16 h. p., except for hilly cities, where at least 20 should be used, if five are to be carried. In cities with fairly level streets, as low as 10 h. p. is often satisfactory. Either planetary or friction transmission may be used in place of the sliding gear, the only objection to the first being the noise when low or reverse speeds are engaged. A wheel base of 101 inches or under, with ample steering lock should enable the cab to turn in a 30 foot street.

But One Model Necessary for Economy

Having selected the model for service, the most economical procedure is to stick to that model, until a better one is found. In endeavoring to find this better model, let it be taken on trial, with the maker to make all repairs due to defective material for the trial period and not to purchase outright. The reasons for the adoption of but one model are here given, and will appeal to both the engineering and business departments: First, the cost of the stock of spare parts for a given pattern is less by nearly half than for the same quantity of two or more different patterns, and this cost increases with the number of patterns. Again, two models may not have similar control; the one may have an accelerator pedal while the other may not, hence a driver of the latter car is liable to accelerate instead of braking on the former car. The clutch and brake may be transposed on the pedals, or the brake lever operate in a different direction. The consequences of these differences in control in a tight place can be imagined.

Another reason is an advertising one. All the cabs being alike, with distinctive coloring, they are recognized by the public, and having been found comfortable, well upholstered and speedy they will be hired where even with a good reputation the different models of cabs of the same company might not be recognized as readily. The point is often of paramount importance.

Important Requirements

Having determined the horse power necessary, fixed upon the initial cost and observed the performance of the cabs under trial, the next requirement is the ease of repair, as previously stated. This is important on any automobile, and doubly so on a taxicab, as hours out of service mean dollars out of pocket. The demonstrator often shows how readily the valves may be removed and replaced, for example, but when it comes to removing the motor for overhaul, it may be necessary to take off the radiator, dashboard, footboard, clutch, transmission, break four water joints and as many pipes for fuel, inlet and exhaust, and even remove the body, all of which takes up much time. As an extreme case, a "taxicab" which the writer supervised in an overhaul, at the end of six hours, and with the labor of three men was stripped to its frame and axles, when the motor was finally removed. After the trouble was remedied it took four men nearly six and one half hours to get the vehicle in running order again, the body having to be fitted with great care to the chassis. Evidently, this cab was not a commercial proposition, yet there are numbers running in various cities at the present time and probably all acting as profit-eaters. Originally, they were "touring cars" of short wheel base, and with a landaulet body became "taxicabs," selling for considerably under the price of the genuine article, hence their considerable use. While occasionally cars for light touring may be transformed into good taxicabs, the above is the strongest argument for the use of the specially designed machine.

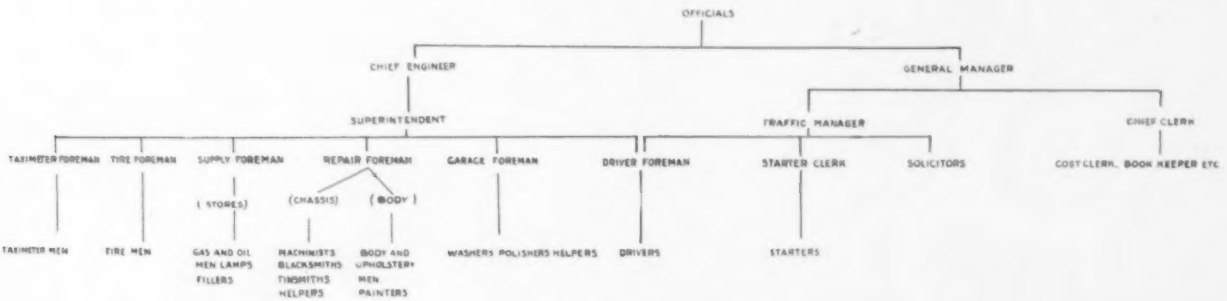
The removable unit system of construction presents the ideal form of taxicab construction to the writer, and is undoubtedly the cheapest in the end. However, in several cases, the prices charged for such chasses are too great as compared with others of less ease in removing and replacing units of the power plant, and the removability sacrifices in a measure of the proper design of the working parts. This will no doubt be overcome in time and the system will, in the writer's opinion, be the eventual form for all public service vehicles.

Body Construction

The construction of the body should be given the same care as that of the power plant, particularly as regards comfort to the passengers, appearance and durability. The limited length of taxicab chasses necessitates the back seats being somewhat in the rear of the rear axle; the greater this distance the less easy the riding unless extra good springs are fitted. Upholstery should be of leather, cloth wearing and soiling too readily. If the landaulet body is used, the roof joint should be water-tight, so as to prevent injury to the passenger's clothing. The coloring should be neat and the fittings clean, these points going a long way toward increase in custom. As to durability, most ordinary landaulet bodies loosen at the joints in cab service, hence specially built bodies should be obtained from constructors who specialize in such work or from the cab makers themselves.

Personnel of the Service

The accompanying diagram gives the scheme for the personnel of a taxicab service. It will be noticed that there are two main departments, the engineering and the business; this is a feature of the transportation business all over the world, and is absolutely necessary to the existence of a taxicab company, unless that rare example, a business man and



engineer combined can be obtained. In this feature lies one of the differences between the taxicab and other forms of business, where the general manager is the single head. It is noticeable that when the manager was the head of affairs in a number of omnibus and taxicab concerns, that the money lost in operating the vehicles was almost ruinous, due to the inexperience of the manager in shop matters. Hence the need of dual control.

In such case, both heads are responsible to the officials or board of directors, and while there is independence for each in his departments, there is also an interdependence between them. Thus in the matter of the drivers, the traffic department controls them from the time they leave the station till the time they return, when, on entering the building, they come under the control of the engineering department. This arrangement tends toward discipline and smooth running, and avoids the clashes incident to the misbehavior of drivers in one department when under the control of another.

The Engineering Department

As will be understood from the diagram, the chief engineer has entire control of all employees from the superintendent down, in the garage, with the exception of the drivers when they leave with their cabs to go to the stands, etc. When a change of model, an adoption of other make of tires, or other work is necessary, the chief engineer makes such changes, subject to the control of the officials, and for this purpose is assigned one or more draughtsmen. His reports

go direct to the officials in all cases. The superintendent has charge of all departments in the garage, the drivers through their foreman, and the tire and taximeter departments, when these are operated by the company. Generally speaking, however, tires are sold to the taxicab companies by so much per 1,000 miles or over, and the tire men are employees of the tire manufacturer. This is also true of the taximeters, where an employee of the renting company takes charge of all repairs and adjustments to the meters.

The Repair and Garage Foreman

Under the control of the first of these foremen are the chassis and body forces, the former consisting of the machinists, blacksmiths, tinsmiths, assemblers and helpers. The body forces consist of body men, upholsterers and painters, whose functions like those of the chassis force are too well known to need delineation here. Under the garage foreman are the washers, polishers and laborers, the latter cleaning up the garage, etc. Thus the cabs are cared for completely until ready to leave the garage.

The supply foreman or store-keeper, as he is sometimes called, is responsible for all stores (waste, oil, gasoline, lamp oil, lamp and spare chassis parts), and issues these on receipt of orders from the department foremen. Under him are the gasoline and oil men who attend to filling the tanks, and the lamp men who fill and care for the lamps. A section of the store-room is given over to spare parts for the chassis and like supplies, and the foreman's clerk delivers these on order from the repair foreman. In this manner, the one department has track of all supplies used in the garage.

The Driver Foreman

In addition to having charge of the drivers, the foreman is responsible for their instruction and for the "breaking in" of new men. He submits two sets of reports, one as regards the men in the garage, the mechanical troubles or those of tires or taximeters encountered, and any damages resulting from carelessness or external cause to the superintendent, and one regarding the behavior, etc., of the men on the streets with which is incorporated an account of the damages, etc. Thus both the engineering and business departments are in touch with the vital elements of the service and can consult with each other on any points needed, both being equally well informed. This foreman is one of the most important men in the service, and he should be encouraged to make suggestions from time to time regarding the service in addition to his regular reports. Sometimes a difficult problem may be solved by his experience. He should be provided with a car or motorcycle so that at intervals he can cover the territory of the service and act as an inspector.

The Business Department---The General Manager

The general manager will have charge of the business department, which includes the traffic department in this case. In the diagram are only indicated the chief clerk, with his supernumerary cost-clerk, bookkeepers, etc., the pay and other sub-departments resembling those of other businesses employing skilled labor and being of course under the general manager. The latter will receive the reports from the traffic manager and chief clerk in addition to the other heads of sub-departments of the business end. He, as well as the chief engineer and superintendent, will have an assistant or stenographer, or both where the business warrants it.

The Traffic Manager

The traffic manager is responsible for the laying out and conduct of the territory, the location and maintenance of stands with the necessary legal procedure for their procuring, etc., for the drivers when on the street or at the stands, and for the starters, these two latter forces through their foremen of course. As this is a most important position both from a business and legal standpoint, the manager should be in touch with the legal adviser of the company, and not have to go through the general manager as is often the case. The assistants, usually two or three clerks, keep the traffic books, permits, etc.

The Solicitors

By far the most important employees in the business department are the solicitors, who are directly under the supervision of the traffic manager and who "solicit" permits for stands, calling stations and rights of way from clubs, hotels, in parks, etc. These men are the "business getters," and are often called upon to settle disputes, adjust claims (in the absence of a claim department), and make personal calls on prospective monthly or yearly customers when such patrons are catered to by the company. They are usually assigned territory after the manner of the "block engineers" of a telephone company.

The Starters

When stands with box and telephone connections are used, as at hotels and clubs, a starter is located at each stand. His duties are to assign the cabs to fares in the order of their arrival, to note the time of departure and return of each cab, to record the destination of each, to furnish change, and give any information necessary. In some cases, they also serve as collectors of the receipts from the drivers and direct the latter the same as the foreman, but this may lead to confusion unless a clear definition of their duties is made. The starters make report to the starter clerk, who in turn transmits them to the traffic manager.

The organization following the diagram is intended for a "stable" of at least 70 cars, and works effectively with as many as 500. For the small company operating, say, 20 cabs, the following personnel, derived from the diagram, will be suitable. It will be understood that the cabs will be stock models and remain in service without changes in design for this or smaller numbers.

Superintendent—Acts as chief engineer, repair and driver foreman.
Garage Foreman—Garage and supply foreman.
4 Machinists—One of these should be experienced in blacksmith work, at least.
2 Washers—One for day, the other for night.
2 Polishers—One for day, the other for night.
2 Helpers—Clean garage, assist in moving cars, fill lamps (when this is not done by the drivers themselves).
20 Drivers—Drivers fill up with gasoline and oil, fill lamps.
Starters—According to the number and size of stands, one for each.
Manager—Makes all arrangements as traffic manager, solicits business, confers with superintendent as regards drivers, etc.
Clerk—Keeps books, day cards, etc.

Where pleasure or commercial cars are garaged in connection with the taxicab business, the machinists, washers, polishers and helpers are taken from the regular garage force. The superintendent and manager in such case are often the manager of the garage himself.

In this manner, an organization for a stable of any number of cabs can be made up, but except for a very small number of cabs, the two departments should be kept distinct. The organization given is not infallible, but has worked well with varying numbers within the limits mentioned. The accounting should be simple and based upon that of similar enterprises.

The Repair Shop and Its Methods

It is of course better to lay out a special repair shop for the cab service than to adapt the shop ordinarily used for the care of pleasure or commercial cars. In making the lay-out, it should be remembered that a poorly equipped repair shop will by the time taken in repairs, thus laying up the cab or cabs idle, the cost of doing machine work with inadequate tools and the like, eat up a great part of the profits, if not all of them. Hence the need of a systematic lay-out, which should tend more toward a manufacturing equipment of tools than toward that of an ordinary repair shop.

A question depending for its solution upon the number of cabs used and their construction is that of spare parts. Where but few cabs are in service, the spare parts stocked will be limited to valves, springs, caps, etc., while if the removable unit system is used, a spare unit in addition is carried. For the larger numbers, spare cylinders, connecting rods and like parts are carried, particularly when all repairing is done by the company itself. Having to purchase spare parts from the makers of the cabs entails the outlay of much capital, from time to time, and is not economical except in large quantities, while having machine work done outside is in the end even less so, unless the contracts are large. The holding of a large stock of spare parts, particularly for a small company, ties up considerable capital, although with proper selection, all emergencies can be coped with. These facts point to the necessity of having one type of cab only in use.

The shop equipment in number and style of machine tools will depend upon the shape of the shop portion of the building, the number of cabs to be repaired, and the nature of the repair work, and the selection is best left to the chief engineer or his representative.

Some Facts About Repairs

A mistake made by many prospective taxicab men is in supposing that with, say 50 cabs, at least 48 should be ready for service at any time, with one or two of these in the garage as reserve. Experience has shown that a minimum of 15 per cent. of the entire number of cabs used by any company will be needing repairs at all times, this percentage varying with the length of time per week of each cab in service and also with the number of cabs and the traffic conditions. This looks large, but it is not; as many as 33 1-3 per cent. of the locomotives of a great railroad are at the shops in the spring months, and rarely does this percentage fall below 18. And the locomotives run on well-ballasted tracks and are less liable to accident than the automobiles.

The chief causes taking the cabs out of commission may be stated as follows, following the information (with percentages), obtainable in New York and London: Accidents from outside sources (other drivers, street cars, runaway teams), 10 to 11 per cent.; accidents due to the company's drivers' carelessness, etc., 2½ per cent.; mechanical troubles and breakdowns, 2½ to 3½ per cent.; due to disabled taximeters, 1 per cent. to 5½ per cent.

The latter item chiefly affects the smaller concerns who rent a few taximeters from the makers, and unless a spare meter is kept on hand and someone competent to fit it in place of the disabled one, the cab is out of commission for a period dependent on the arrival of the taximeter representative with another instrument. With the larger companies, where the number of meters used necessitates a taximeter department, the time is limited by that taken by the cab to reach the garage and have the meter replaced. Hence, the installation of a sound and readily removable taximeter on each cab will tend to decrease the time taken in replacement, and be thus a source of revenue to the company.

Day and Night Repairing

Another mistaken idea, particularly where considerable chassis work is done, as in engine replacement, gear-box repair, etc., is that the night is the proper time for such work. The argument is, that the cabs being all out for theatre, club and reception calls, in the first half of the night, work may go on uninterruptedly and with success. Unfortunately, it has been found by bitter experience that where first class results are looked for, work performed at night, even under the finest lighting, falls short of the required accuracy and cannot be depended on. Where the removable unit system is used, this does not apply to the replacement of any of the units nor to minor operations, but accurate machine work should in all cases be done during the day, and this points strongly to the need of a well-organized shop taking the 15 per cent. and up of disabled cars at any time. For the night, then, the minor operations and only fine work in cases of emergency.

Whether day or night be selected for the regular inspection, the washing down, going over and adjusting and finally the polishing, should be carried on systematically as soon as the cab enters the garage and takes its berth. With such procedure, the cabs will generally be kept on the stands or streets in larger numbers, and other things being equal, the company whose cabs are more systematically inspected will get better custom than its rivals. Trusting to luck, that the cab will operate "all right" until the crash comes, is the feeder of the bankruptcy courts.

(To be continued.)

The Worm Drive

ITS ADVANTAGES AND EFFICIENCY IN SERVICE

BY WARREN NOBLE

ORM, or screw gearing, is among the oldest mechanical movements and, until recent years, has been employed to obtain either a great mechanical advantage or a considerable reduction in speed between related machine parts. Later developments, however, saw its introduction as a driving gear for higher speed mechanisms, and while its reputation as an effective but inefficient mechanism remained, its users began to see greater possibilities for its use than they at first expected. Worm drive for automobile purposes, however, is counted by many as a new development, while as a matter of fact, its use commenced with one of the earliest, if not the earliest, really successful automobiles built in Great Britain, the "Lanchester." The makers of this car developed, at the inception of its manufacture, a special form of worm gear which they have employed continuously since 1897, and the mechanical success, which they undoubtedly achieved with their worm gear, led to the Dennis Company following their example and, later, another company, known as the "New Engine Company," adopting similar practice. These three concerns, however, constitute the disciples of worm driving, and it was not until the advent of more silent engines and general reduction in noise that the greater bulk of the English manufacturers took advantage of the properties which the worm drive provides. Conjunctively, however, with the created public demand for silence they realized in a body the necessity for the abolition of noise in their transmissions and an increased efficiency with the result that many of them closely investigated the merits of the worm drive and immediately adopted it for their new models. To-day a very high percentage of the British cars are worm driven, both in the commercial and pleasure fields, while weekly reports from Europe indicate that not only are the French and Germans following in the lead as quickly as they can accumulate the necessary experience, but that the balance of the prominent English manufacturers are about to adopt the worm drive as standard in the near future.

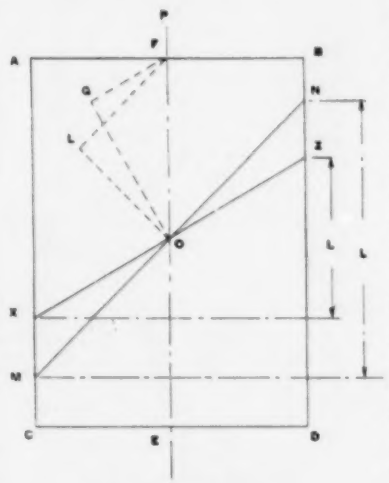
In America the same thing obtains—the demand for commercial efficiency by the large manufacturers and the undoubted merits of the worm drive have led to widespread experimental investigation, and it is an open secret that not only are very many of the American firms about to announce worm driven models in the near future, but that certain of the truck manufacturers are already decided converts to its use.

The Old and New Worm

The engineer, unacquainted with modern worm driven mechanism, will immediately think of a single threaded worm, such as used in a steering gear, an irreversible worm, and it is possibly due to the chains of precedent more than anything else that high efficiency worm gearing is so little known among the engineering community. In place of the old single, double, triple, or even quadruple thread worms, which the practice of the past has rendered familiar, we find worms of peculiar tooth formation, with seven, eight and as high as fifteen threads, or teeth, with very high spiral angles and perfectly reversible. It is in the multiplication of the number of threads, or rather in the spiral angle employed, that the fundamental difference between the worm gearing of our grandfathers and the modern high efficiency type of the present day is concentrated.

Rise of Efficiency With Spiral Angle

The rise of efficiency with the spiral angle may be very readily seen from the accompanying diagram. In this let a, b, c, d, represent the development of a worm and let x, y, represent a thread on its surface. Let the pressure of the teeth be represented by force P. This force may be resolved in two directions with regard to the thread, the one component normal to the thread represented by o, g, and one parallel with the thread represented by g, f. Obviously, the work lost during the revolution of the worm will be represented by the product of the component normal to the thread o, g, the co-efficient of friction between the materials from which the worm and wheel are constructed and the length of the thread x, y, while the total work done is the force P multiplied by the distance through which the thread moves in a revolution—that is to say—the lead of the worm, represented by L.



Worm Gear Efficiency

Showing why the efficiency increases with an increase in the spiral angle

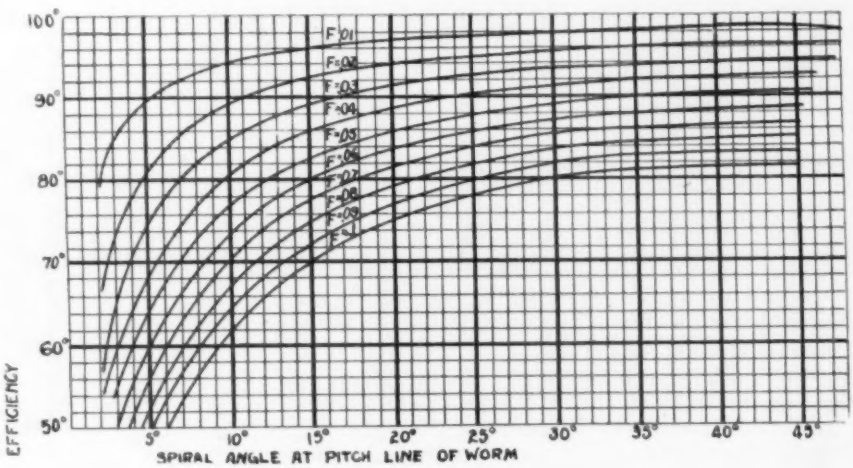
Let M, N, represent a thread of greater spiral angle upon the same surface. Again we may resolve the pressure on the teeth in directions normal to and parallel with the thread o, h, and h, f, respectively. In this case the lost work is represented by the product of o, h, the co-efficient of friction and the length of the thread represented by M, N. If we compare this product with that representing the lost work in the previous case we see that the component o, h, is less than the component o, g; that the co-efficient of friction in the two cases remain the same, and that the length of the thread is increased from x, y, to M, N. It is found that the product of these factors remains approximately constant throughout a considerable range of spiral angle, but it will be very readily seen that the lead of the thread M, N, is far greater than that of the thread x, y; hence, although the lost work is nearly the same in both cases, the total work done per revolution is considerably greater, and since the work done minus the work lost represents the efficiency, it will be seen that the efficiency of

the worm having the thread M. N, at the largest spiral angle is far greater than the efficiency of that having the lesser spiral angle.

It is found that the efficiency rises very rapidly through the range of angles until a 35 degree value is reached and that from 35 degrees to 45 degrees the curve of efficiency is almost flat. If the reader will inspect the accompanying chart of calculated efficiencies of worm gearing, he will notice this peculiarity in the curves and readily appreciate the principles upon which modern high efficiency worm gearing is constructed.

Slight Efficiency Increase With Wear

Scanning these curves and selecting that plotted with the friction co-efficient at a .03 value, which is fair for new gearing cut under modern conditions, a good general idea of the efficiency values of modern worm gearing may be achieved. The writer, who has had very considerable experience in worm gearing in the past, finds that the average efficiency is approximately 90 to 91 per cent. new to as high as 94.6 after continued use of the gear. This is decidedly borne out in practice, as its life proceeds is noteworthy. It is easy, however, to predict the effect since every turn of a gearing properly mounted and suitably lubricated simply increased the degree of polish of both worm and wheel surfaces causing them to approach more nearly the truly smooth condition demanded. Thus the efficiency rises and the liability of wear decreases with the continued use of the gear. This is decidedly borne out in practice and in pleasure automobile construction it is no uncommon thing to find an axle that having run better than 50,000 miles in hard service shows no signs of wear in the gears. The importance of this difference between worm gearing and other forms should not be overlooked, since with bevel and spur gears the commencement of wear is but the beginning of the end and, instead of improving with life, such gears steadily depreciate.



Theoretical Efficiency of Worm Gears

These curves show how rapidly the efficiency rises with the increase of spiral angle and that there is very little increase in efficiency after an angle of 35° has been reached.

Types of Worm in Use

There are two types of worm in use, the double throated, or hour-glass type, and the straight type in which the worm wheel alone is throated. There is considerable discussion at the present time as to the merits of the respective types. Advocates of the double throated type claim that the lands, or bearing surface, of the worm with the wheel, is considerably higher than with the straight type, and were it possible to pursue similar methods of manufacture in both cases, there might be some advantage from this quality alone. Practice, however, steps in and by vastly increasing the difficulties of very accurate cutting (and at this juncture it may be well to state that the formation of efficient worm gearing demands the utmost accuracy) discounts the claimed advantage in the majority of cases and leaves the straight worm in the position of equal or superior advantage to the opposed type, since its threads may not only be more accurately formed initially, but may be finished and brought to an exceedingly high state of polish by a special grinding process.

Success Depending Upon Accuracy of Tooth Generation

Delving into the manufacturing qualities of the two it may also be said that the straight type is capable of more accurate production at less cost than the other type, although certain European makers are successfully cutting and using the concave pattern. The advantage of greater land surface, even if obtained, is of little value in truck gears where the diameter of the worm gear is almost invariably large, and in which the lands extend in any case for at least two or three teeth. In worm gearing, as indeed is the case with all other forms of tooth gearing, perfection of manufacture is most important and the perfection of such manufacture has been a ture has been a matter of extreme difficulty on the part of the English engineers who have engaged in it. The success matter of extreme difficulty on the part of the English engineers who have engaged in it. The success or failure of a gearing depends chiefly upon the processes employed in its generation and the utmost secrecy with regard to these processes is maintained by the firms engaged in its manufacture.

Problem of Suitable Mounting

Next to the generation of the gears themselves comes the question of suitable mouting, and it is necessary that such mounting be quite substantial, holding the gear without deflection on the part of the housing. This condition, however, is far easier to satisfy with worm gearing than with bevel gearing for high power, since the heavy load is axial with the worm. The axial thrust in worm gearing approximates the radial load on the bevel pinion in gearing of similar diameter, but it is not sufficient to use thrust bearings of rated capacity to absorb this as a constant duty, for such bearings are, as a rule, furnished with small balls which assume too great a speed of revolution for constant service. The writer recommends the use of balls of the largest possible diameter, very securely caged and abutted to races of heavy section. It is in mounting that the concave type of worm presents its most serious disadvantage, for it demands absolutely accurate centering with the

worm wheel in two directions, and the slightest misalignment or displacement will cause it to cut and seize, so destroying its members. Where a worm gear is mounted on a differential housing it is, of course, necessary to provide aligning thrust bearings on either side of the housing no matter which type is used, but the straight type of worm once being centered with the worm wheel, may suffer axial displacement without affecting its efficiency in the least. Both from the manufacturers' and users' standpoint this quality should be seriously considered in determining the type of gear to be used.

Large Reduction Possible

The subject of worm gearing, its adaptations and possibilities is so vast that it cannot possibly be treated in a single article, but possibly the readers of this Journal are more interested in its general adaptation to trucks than to the other phases of its potential field. Pursuant of the original Daimler practice it may be used as a secondary reduction in place of bevel gears in the chain driven type with the assurance that not only may a very wide range of ratios be used on similar centers, but that the chains constituting the final drive will be saved and their action materially quieted. It is, however, as a direct final drive that worm gearing probably offers the greatest inducements, since with it any range of reduction within reason may be achieved with the utmost facility, while undoubtedly the use of a single reduction in place of a double one materially aids the general efficiency of a machine. Reductions of twenty to one may be as easily accomplished as higher ratios without the efficiency of the combination being affected and, moreover, reductions ranging from twenty to one to ten to one may be made interchangeable upon similar centers without disturbance of standard parts conjunctive with the gears. The advantage of such a range will be immediately apparent to the truck manufacturer who, selling his product for a vast variety of purposes and distributing it over territory widely varying in contour, is continually faced with the problem of suiting a gear ratio to the conditions to be encountered. There is little doubt that this feature alone is so valuable as to determine the complete adoption of worm drive for truck purposes in the very near future.

Very Silent

The silence of the worm gear is indisputable, its efficiency demonstratable. It demands less intricate mounting, involves no hardening risks, provides an exceedingly wide range of gear ratio without change of parts, has an exceptionally long life, is independent of subsequent adjustment and is as cheap to construct as the present bevel gear. Its efficiency under ideal conditions is at least equal to the most accurately cut and delicately adjusted bevel gearing, while its commercial efficiency is infinitely higher. There is a total lack of the short period vibration invariably set up with bevel gears, with the result that not only is the final drive silent, but the sounds of the transmission devices between the final drive and the engine are themselves mitigated.

The case for the adoption of worm gearing is complete. Already many of the more progressive manufacturers of trucks are deeply engaged in the investigation of its merits with universally favorable results. Lending itself directly to the characteristic demands in pleasure cars there still lies before it a great field of usefulness in the truck field, and it is in this field that one must look for the proofs of its undoubted superiority over other forms of gearing from which considerable reductions in ratio are demanded.

Worm vs. Chain-Drive for Motor Trucks

The following is an answer by H. Kerr Thomas, of the Pierce-Arrow Co., to an editorial in the March issue of Machinery:

To the Editor—Machinery.

Sir: My attention has been directed to your editorial on the above subject appearing on page 529 of your March issue, and I trust you will find me space in your journal to make some remarks in reply, as the statements made are opposed to the experience of the very considerable number of engineers who have now for years been engaged in building automobiles, both pleasure cars and trucks, equipped with worm drive live axles.

Let me say at once, that unless the best workmanship is available, any kind of worm gear is best left alone, and in this matter I am entirely in agreement with the writer of your article. He proceeds, however, to state that the efficiency is at best "still relatively low." At this point it becomes evident that modern practice and modern engineering literature have alike been overlooked. The efficiency of worm gears properly designed and correctly mounted is as high as 95 per cent. This statement is made from my own observation and can be calculated from the formula:

$$e = \frac{1 - \mu \frac{P}{\Pi D}}{1 + \mu \frac{P}{\Pi D}}$$

where U=coefficient of friction
P=axial pitch of worm
D=pitch diameter of worm.

Confirmation of this is given by Fred A. Halley in his handbook on Worm and Spiral Gearing, published in New York in 1903, reproduced, I believe, from articles in the American Machinist. Any engineer may, therefore, verify this fact for himself. Since, however, the efficiency is said to be "relatively low," it may be interesting to turn to another authority in our attempt to find something higher.

In the "Automobile Trade Directory," published in January, 1911, on page 746 will be found a table by Worby Beaumont, an engineer of high professional standing in England, and himself the Consulting Engineer to the Royal Automobile Club, who may, therefore, be supposed to speak with some authority. This table gives the efficiency of various types of transmission mechanism. Here it will be found that one set of gears will absorb 5 per cent. of the efficiency, and two chains 6 per cent., or a total of 11 per cent., giving for a bevel and chain transmission of the usual type a total efficiency of 89 per cent. against 95 per cent. for worm transmission.

Were it possible to employ for a large truck a single final bevel reduction, the efficiency of the bevel gear would be equal, but not superior to that of the worm gear; owing to the size of gear which this would involve. Such an arrangement is not possible, however, and chains must be employed, making the

further reduction in efficiency referred to. Beaumont's figures, however, are for new chains, and it is a fact well known to all engineers that the efficiency of chains falls off rapidly as the chains become stretched, and as the sprockets worn in use, so that the 89 per cent., when new, is probably as low as 75 per cent. long before the chains are worn out. It is, therefore, difficult to see in what way the efficiency of worm gear is "relatively low," particularly when it is remembered that the wearing of a worm and worm wheel does not reduce its efficiency at all, owing to the fact that the tooth sides are flat and remain so in spite of wear.

Your article next makes mention of the "self locking feature" of worm gears. It is not a little curious that this point is so frequently brought up—it is so obvious that no automobile could exist with a worm gear were it not possible to "coast" as freely as with a bevel, that it is difficult to conceive any engineer building such a machine unless he had first proved the fallacy of this impression.

Irreversible worm gears are so common in, for example, elevators and dividing heads of machine tools, that the uninitiated are apt to overlook the geometrical principles on which the operation of any worm gear depends, and which makes it an easy matter for the designer to make the gear reversible or otherwise at his option; it is only a question of varying the gliding angle, which is always a function of, never equal to, but greater than, the spiral angle.

As to durability, which is the next point raised, it is probably not within your knowledge that heavy trucks fitted with worm gear are in general use in England and have been for the last seven or eight years.

In London omnibus work, where 3 ton chasses are employed in what is admitted to be the severest work which can be found, worm gears have given satisfactory results for the last five years.

I have before me as I write, a letter from the operating engineer of Thos. Tilling, Ltd., who own and operate a large fleet of public service vehicles in London, in which he says:

> "The average life of a worm drive on an omnibus is between 28,000 and 30,000 miles; now that we have redesigned the torque rod the life should be 40,000 miles."

I have yet to find any chain which will, in average working, approach one-half this distance.

Reliability is much the same as durability, but as the two are mentioned separately in your article, I will deal with them in the same way, to take only one example, Messrs. Dennis Bros., who were the pioneers of the worm drive for trucks, have always given (see their published catalogue) a specific guarantee of two years with every worm driven rear axle they have made, and their range of models has for 5 years included those of 5 tons capacity.

Has any manufacturer of other forms of drive exceeded this?

Lastly, your article introduces the old argument of complication and unsprung weight and all the disadvantages thereof. This is such an old friend that those of us who have had some experience in the automobile industry have lively recollections of precisely similar objections when the gear drive was first substituted for chains in the lighter vehicles, such of us as are familiar with present day practice also know how far they were removed from the truth.

The analogy between pleasure cars and trucks is largely in favor of the latter, inasmuch as their slower speed is in their favor size for size, the destructive effect of shocks, etc., being measured by the energy stored in the vehicle, (or any part of it.)

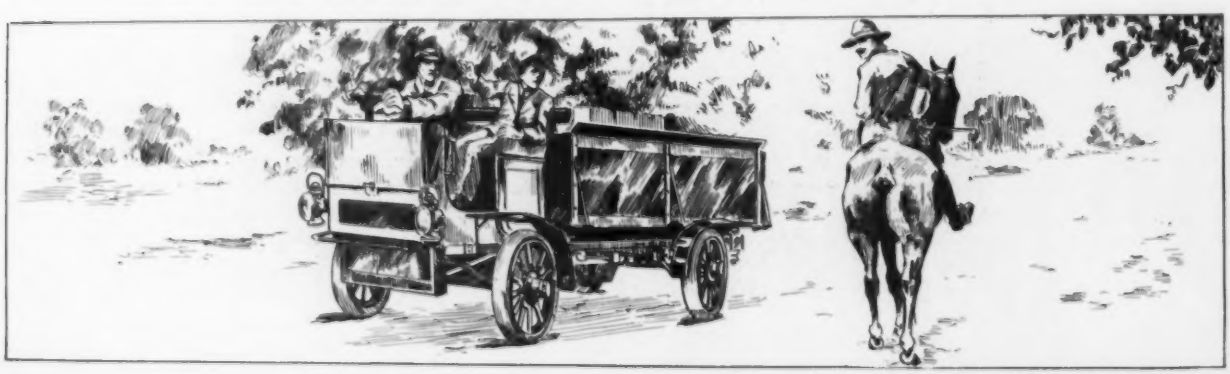
$$\text{Since energy} = \frac{WV^2}{64.4} \text{ foot pounds,}$$

it follows that destructive action will vary directly with the weight and directly with the square of velocity; hence, it is an easier thing to make a live axle for a truck than a pleasure car, because of its lower speed.

With regard to repairs, it is obvious that a broken chain can be easily repaired; it is equally obvious that such repairs are unnecessary if no chains exist. If a worm gear will last from 30,000 to 40,000 miles as it does, it may be assumed that roadside repairs are not a frequent occurrence, and as far as the axle itself is concerned, it becomes a problem of every day mechanical engineering to design what will be strong enough for the purpose.

Lastly, the whole question of worm drive for automobiles is regarded as a new and obscure thing—not fit to be understood. That it is so in this country must be the result of accident or prejudice. It was past the experimental stage 10 years ago in England, and such names as Lanchester, Napier and Daimler in pleasure cars, and Dennis, Halley and Leyland in trucks, not to mention many others, should be sufficient guarantee that the worm axle is a practical and reliable proposition.

(Signed) H. KERR THOMAS, A. M. I., Mech. E.



Big Demand for Motor Fire Wagons

OVER 30,000 MACHINES NECESSARY TO FILL NEEDS DURING NEXT FIVE YEARS

AS the result of considerable correspondence with the Fire Chiefs of the United States and Canada, we are convinced that very few men in the commercial car trade are fully aware of the immense impending demand for this type of motor vehicle. This correspondence shows conclusively the following facts:

First, That the Fire Chiefs of the country are fully alive to the advantages of motor driven fire apparatus, and that they need no further proof than that which has already been shown them to obtain their approval.

Second, That a sufficient number of motor fire wagons of various types are already in use, so that the results accomplished by them, properly classified and tabulated, will be sufficient proof in itself for the Fire Committee of any town council.

Third, That the advantages of motor driven fire wagons are even greater in the case of small towns than they are for the large cities.

Fourth, That over 30,000 horse drawn fire wagons are now in use, or one for each 2,500 to 3,000 inhabitants, and the replacing of all of these with motor driven vehicles would require from thirty to forty thousand vehicles during the next five years.

The replies received from a large number of Fire Chiefs, about one-half of whom have already one or more motor driven fire wagons in their departments were very emphatic in their advocacy of the motor fire apparatus, most of them stating that it was their opinion that this class of motor driven vehicle had long passed its experimental stage, and that all Fire Departments would adopt them before long.

The only objection raised by any of our correspondents were those of George S. Coleman, of Worcester, Mass., and Henry R. Yates, of Schenectady, New York, who both state that motor fire wagons are inefficient in heavy snow. To offset this, Mr. Edw. F. Dahill, of New Bedford, Mass., and Arthur S. Aungst, Alliance, Ohio, both state that one of the special advantages of motor fire wagons is their ability to run over bad roads and through snow where horses would fail. As new Bedford, Mass., has four and Alliance, Ohio, has two motor vehicles now in use, Messrs. Dahill's and Aungst's opinions should carry weight.

Among the advantages particularly mentioned by the Fire Chiefs are the quickness in getting to the fire, the covering of large territory and reduction of fire loss because of this quickness, and speed, the low cost of maintenance as compared with horses because of infrequent use, and because they carry more hose and a greater number of men available for fire duty.

Those Chiefs who have had motor cars in use for a considerable time are very enthusiastic as to their future, and while our limited space will not permit quoting from all of their communications, we give some extracts which are typical of them all.

Arthur S. Aungst, Chief of Fire Department, Alliance, Ohio, says:

"The motor driven fire wagon is more reliable than a horse, it will cover twice the territory that horses will, thereby doing away with building so many sub-fire stations. It is more economical as you are not feeding horses, and the only time motor apparatus costs anything is when you have a run.

It will go to a fire and return and is ready to go again and is not tired if another alarm comes in after it has responded to the first, this, in fact, has been demonstrated here, we had 4 alarms inside of one hour, and the motor apparatus made 16 miles in going to and from fire. Show me a team of horses that will travel that mileage and be good and fresh after pulling 6900 pounds.

As to saving, with horses we have so many small incidentals such as disinfectant, Golddust, soaps, repairs to harness, ropes, and sides of stalls, then you have the chances of horses falling and breaking a leg, or take colds, or dropping over on a hot day on a run, if a horse gets sick it means probably a couple of weeks laid up with the expense of veterinary surgeon.

If the most vital part of an auto gets out of order or broken you can have it repaired in a day's time, I can at least. The auto is controlled with more ease, than a team of horses, it will not run back in the stall when an alarm comes in as will the best trained horses at times. You can do with

Alliance, Ohio, Fire Department, Engine No. 3.
Chief Aungst is very enthusiastic as to the performance of this machine

less men, as the driver does not need to watch his team or be afraid, if a line of hose bursts, that his team will run away, and he can work on the fire.

You can build smaller engine houses, thereby saving at least half of the first cost of your apparatus, it is more sanitary for the men, it gives the men more time to study the fire business, street boxes, etc.

It means the cutting down of the fire loss because of the reaching the fire and putting it out in its infancy, or as a fellow said before there was a fire, this alone if the motor apparatus was more expensive to maintain should be the means of adopting it, if nothing else. We can point back and say, why did the fire department change from the old volunteer hand drawn, to the paid with horse drawn? Certainly it was to get that quickness in reaching the fire. Now to-day we are placed in the same position, we are as fast as well drilled men and well trained horses with the quick hitches will permit us to be, and the motor apparatus has given us a quicker way to reach the fire, and if every fire was extinguished in its infancy we would never hear of large fires.

In building machines they should have good strong frames and powerful engines, not less than 60 h. p. for combination chemical and hose wagon and 70 or 80 h. p., for engines. I would add that the transmissions and all parts should be built strong so that with your large horse powered engines will not strip or tear them to pieces.

Yours very truly,

ARTHUR AUNGST,
Chief Fire Department."

MR. J. T. Mertz, fire chief of Akron, O., has two motor fire engines in his department, he says: "We can get more out of less men with the auto apparatus than we can out of horse drawn machines, and it costs less money, on the horse drawn engine it takes one man to look after the steam engine; another to take care of the coaling and a third man to look after the horses when the fire is reached, so that in a company of eight men, only five are available to fight the fire. In a company using motor apparatus, only one man need attend to the apparatus, while the others are fighting the flames. He states that the cost of operating Engine Company No. 4, which uses horse drawn apparatus was $8,841.86 for one year, using eight men, while the cost of operating Engine Company No. 8, with auto apparatus, was $5,784.44, representing a saving of over $2,600 in one year. Besides this is the saving of the salaries of two firemen. $761.86 was spent on the horse apparatus for maintenance as against $132.44 on the motor apparatus.

In support of our second contention, we will in a future issue publish tabulated figures showing the cost of maintenance of motor fire wagons as compared with horse drawn apparatus, the number of men required with each type and their original cost and average depreciation, covering the use of a large number of fire wagons of different types.

In reference to our third contention, the fact that small towns find the maintenance of a team, or two teams of horses a very heavy burden, where one motor will answer all requirements with practically no outlay in the way of maintenance charges, makes the motor proposition for the smaller towns very much more advantageous than in the case of the large cities, as frequently in the smaller towns the houses are widely scattered, and the distance to be covered is considerably greater than in the cities where the fire companies are distributed so that each has only a comparatively small territory to look after.

Our fourth statement is based upon the figures received from thirty different towns, selected from various parts of the country and varying in size from 3,000 inhabitants to 160,000. The actual average of population for each fire wagon in these towns is 2,927, and there are in use in these towns a total of 322 fire wagons of which only 27 are motor fire wagons or about 9 per cent., and as this correspodence was with those towns which were most likely to have motor apparatus in use the percentage of motor driven fire wagons now in use in the United States is probably less than 5 per cent.

The average cost of each horse drawn fire wagon was $3,822 and for each motor driven $4,886. The cost of maintaining horse drawn vehicles and horses averages $43.17 for each vehicle, each month, and for motor driven apparatus $12.28 for each vehicle, each month.

A SHORT HISTORY OF NEW YORK'S MOTOR FIRE EQUIPMENT

THE inauguration of motor fire apparatus in New York City occurred about a year ago, and since then so pronounced has been the success of the machines that Commissioner Waldo predicts that within five years there will not be a horse used in the department.

The first piece of motor fire apparatus which appeared in New York was a hose wagon which was stationed in the high pressure zone in the lower part of the city. It immediately demonstrated its superiority over horse equipment by averaging a speed three times as great as that of the horse drawn apparatus, attaining a speed of thirty miles an hour, while at the same time it carried a load 50 per cent. heavier than the horse carts. Weather and road conditions did not affect the operation of the truck, and while horses slipped on sleet or floundered through snow the motor went flying past.

The next piece of motor fire apparatus was of the gas-electric type, a hose tower being taken from a horse cart and mounted on a close coupled motor chassis by removing the front wheels. Said to be the heaviest piece of fire apparatus in the world, this ten-ton fire tower attains a speed of twenty miles an hour, and can be turned in its own length.

A steam fire engine mounted on a motor chassis was recently put into use, and has had much success, while a strictly motor fire engine in which the motor which is used for propelling the vehicle can also be used to drive the water pump will be installed shortly. The advantage of this is obvious in rendering available at the start of a fire, when it is most valuable, full high pressure without the wait necessitated by poor steam pressure on a steam fire engine. In addition to this the New York Fire Department has placed orders for four motor hook and ladder trucks, five double high pressure hose wagons, five regular hose wagons, four seventy-five-foot hook and ladder trucks, ten chief's wagons and four one and one-half-ton motor trucks for the delivery of supplies to the various fire houses in the city, making a total of thirty-eight pieces of apparatus, all propelled by gasoline motors.

A new police patrol, made by the Speedwell Motor Car Co., was recently put into commission in Dayton, Ohio.

TOWNSPEOPLE SUBSCRIBE FOR FIRE TRUCK

Huntingdon, Pa., is evidently not going to be behind the times when it comes to fire equipment. Some time ago the firemen decided that they needed a motor chemical wagon in order to cover their territory, and immediately started a campaign for a motor equipment. With not enough money in the city treasury, a little publicity to the idea started a flood of subscriptions from the citizens, and the subscription fund is growing at such a rate as to leave no doubt of the ultimate purchase of the desired motor wagon.

SAN FRANCISCO FIRE CHIEF WANTS MOTOR ENGINES

Chief T. R. Murphy, of the San Francisco Fire Department, is a strong advocate of motor fire apparatus, and is working hard for the supplanting of San Francisco's fire horses by automobiles which can negotiate the hills of that city at twice the speed of horses.

SYRACUSE, N. Y., MOTOR PATROL STATISTICS

The adoption of motor patrol wagons by the police departments of numerous cities has developed interesting statistics regarding the comparative cost of horse drawn and motor patrols. Deputy Commissioner of Public Safety, S. T. Freidrich, of Syracuse, N. Y., has furnished figures carefully kept, for the old horse drawn wagon, an electric wagon and an up-to-date motor patrol.

According to figures up to a recent date the present patrol, a Franklin, has effected an economy of 37½ per cent. per month, makes calls 45 per cent. cheaper than did the old horse drawn vehicle, and also makes 10½ per cent. more calls per month. The average cost per month for the horse drawn patrol was $414.34. The motor patrol costs but $258.54, and this includes cost for repairs, one repair bill being caused by another car running into the side of the patrol at a street corner.

The horse drawn vehicle made an average of 308 calls a month, while the motor patrol averages 341. The former cost per call was $1.34, the present is 74 cents. The motor patrol averages 25 miles per day. The average for the horse drawn patrol was not kept as the wagon was not equipped with a speedometer.

The commercial car trade will this year be given a decided impetus in St. Paul, Minn., as a result of the action of the Legislature in introducing measures which are likely to pass, compelling express companies to extend their delivery limits.

Already the Schurmeier Motor Company has been demonstrating the cars with one of the express companies, and it is said that several will be placed if the law is passed, as it will facilitate delivery in the Midway and suburban districts.

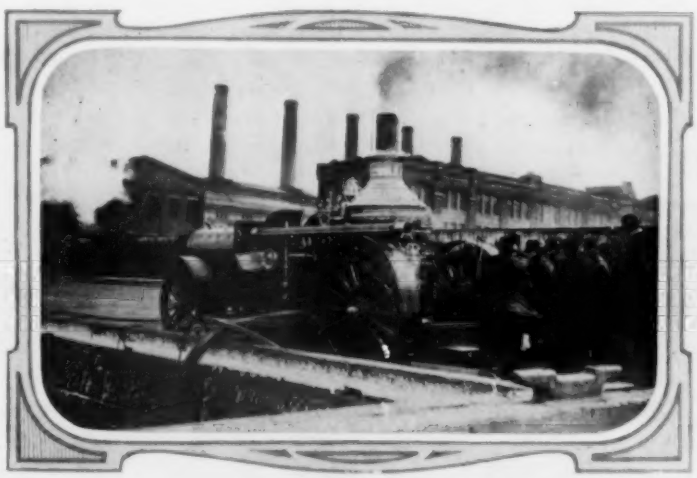
Several of the retail grocery houses are beginning to use light commercial cars for their suburban delivery, and during the past week one of the largest grocery houses on Seventh street has been using a Schurmeier truck with a demonstrator, delivering in the Hill district.

POUGHKEEPSIE HAS MOTOR PATROL WAGON

A motor patrol wagon has recently been installed by the Police Department of Poughkeepsie, N. Y. The machine is upholstered in heavy Turkish leather, and is fitted with all the latest appliances. It can be transformed into an ambulance at short notice and contains an apartment for storing all appliances for first aid to the injured.

Officials of Warren, Ohio, recently made a trip to Cleveland, Ohio; Kenosha, Wis., and to Chicago, in the interest of the city in regard to the proposed new fire truck which the city is soon to purchase.

Salina, Kansas, one of the best little motor trade cities in the country, recently got tired of the old-fashioned fire apparatus. The merchants subscribed for the price of new motor equipment.



An Example of Misdirected Energy

The above photograph is an example of misdirected energy in design. Here is a glaring example of duplication of power plants and the clinging to old types, combined with a hankering for the new. Under the bonnet of this car is sufficient power to pump as much water as any fire engine is ever called upon to throw, yet a heavy, cumbersome machine has been made by duplicating this power plant by that of the old-time steam boiler and engine. Undoubtedly this machine will do the work, but is far heavier than need be and carries twice the mechanism which is necessary. A study of some of the foreign fire-fighting apparatus with their compact pumps direct connected with the gasoline engine indicate the future tendency in the design of such vehicles. We understand the machine was made to special order and the manufacturers are not responsible for its design.

SOUTH BEND HIGHLY PLEASED WITH POLICE PATROL

The new motor police patrol of South Bend, Ind., was officially accepted recently, following an extensive test of the machine by the manufacturers, the Studebaker Bros. Mfg. Co., and several city officials. The machine cost $4250, and is exceptionally complete in equipment. It has been so satisfactory that it is stated that other machines will shortly be purchased, including a motor chemical for the fire department.

Cincinnati's Chief of Police has requested an appropriation for the purchase of three motor patrol wagons.

Interesting Figures Regarding Detroit's Fire Apparatus

BY LEN G. SHAW

FTER having given motor-driven apparatus a most exhaustive test, extending over a period of nearly one year, Detroit's fire commissioners are going to supplant the two hundred and sixty-five horses in the department with automobiles as rapidly as possible. This determination is of itself a matter of consequence as showing the general trend of sentiment in such quarters. However, the Detroit fire commission attacked the problem from an angle that has up to the present time been almost universally overlooked by those who have publicly advocated such a step.

Usually the first question asked by the prospective purchaser of a motor driven truck has to do with the possible mileage, as compared with the distance a horse would travel, this serving as a basis of comparison that exerts a strong influence.

Detroit has reversed the question. It set out to determine, not how many miles a motor driven fire engine could travel, but how few miles a fire team covers in the course of a year. The results were instructive, it being shown that the average horse in the department was eating its head off while standing in a stall waiting for a chance to respond to an alarm and that, paradoxical as such a statement might seem, the fewer the alarms the greater was the relative cost of maintaining the department. When horses are employed, the expense of feeding them going right along whether they work or not, whereas a motor propelled vehicle involves an outlay only when in use.

Here are some of the things the commissioners discovered, and which furnish food for reflection:

Last year 265 fire horses, divided among forty-nine companies, made 7,542 runs, of which 1,756 were fires. The total time put in by these horses when out on runs and in standing at fires was 2,302 hours. The total distance traveled by the horses to and from fires was 12,305 miles.

Feed Horses Seven Days for One Hour's Work

The average time put in by each horse when out in service was forty-six hours—less than one hour a week. One ladder company, in the downtown district, managed to get in 117½ hours of actual work. At the other extreme was a company where the horses put in only twenty hours of actual work in the whole year.

Each horse traveled an average of only 250 miles during the year, the high score being made by one company with a record of 574½ miles, while another traveled only 80½ miles in twelve months.

The average number of runs was 153 per horse, with 390 as the high mark for one outfit and thirty-four, or considerably less than one a week, marking the other extreme.

Horses an Unnecessary Expense

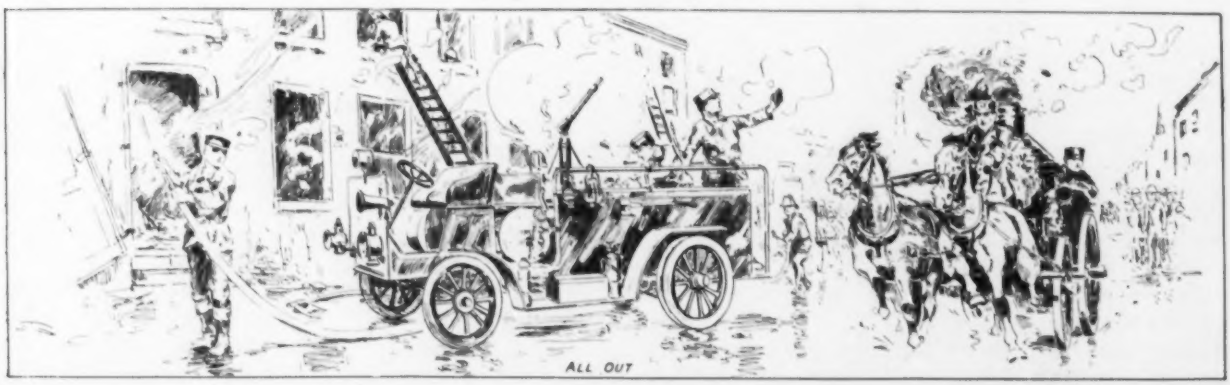
The period during which a horse possesses any value to a fire department is limited to a few years at most. During the twelve months covered by this tabulation $10,000 was allowed for the purchase of new horses. During the same period there was required for hay, oats and bedding for these 265 horses $26,500. Harness and repairs to same called for $700, and $7,500 was required for horseshoeing, making a total of $44,700 for these four items that would be eliminated with motor propelled apparatus, these figures being in addition to $14,000 for apparatus repairs during the same length of time.

Saving Due to Speed

Not the least important feature of the proposed change will be the saving in time in reaching a blaze. Time is of the utmost consequence in fighting a fire. Under existing conditions a team can draw a fire engine a mile in five minutes, if all goes well. Motor driven apparatus will cover the same distance with ease in three minutes. It is estimated that with the ability to reach a blaze in one-half the time now required the annual saving in fire losses alone would be several times the entire cost of motorizing the department.

Detroit's first motor propelled and driven fire engine went into commission in June, 1910. It was a Webb machine. Soon afterward money was available for a second engine, but the commissioners decided to thoroughly test the plan before going deeper. Now a second engine has been ordered, and further additions will come as rapidly as money is available. In addition, there is a motor propelled hose wagon and chemical that acts as a tender for the fireboats, and two Packard machines, designated as the "flying squadron," that carry firemen to fill in during relief hours, or at any other time their services are needed.

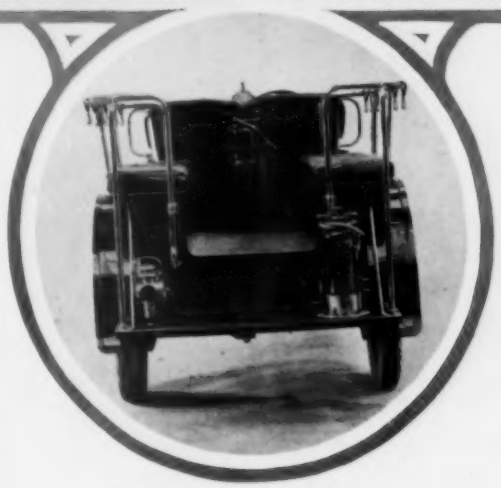
Lestershire, N. Y., is to hold a public entertainment of some kind in order to raise money for the purchase of motor fire apparatus.



The First City to Entirely Do Away With Horse Patrol Wagons

Detroit's Motor Patrol Wagons

One of Detroit's Flying Squadron



Rear of a Detroit Fire Wagon

IT is a trifle over one year —January 7 last was the date, to be exact—since the first auto patrol was placed in commission in Detroit, by Police Commissioner F. H. Croul. This move was made when, after his request for an appropriation had been turned down by the city officials, Commissioner Croul paid for the patrol out of his own pocket, determined to show dissenters that he knew what he was talking about when he declared such an innovation would effect a sufficient saving to soon pay for itself, in addition to the superior service that would be afforded.

Within a few months after the first auto patrol, a Packard Thirty, had been installed the purchase price was readily allowed, and the commissioner was instructed to add six more machines. These went into service last November, and Detroit bears the distinction of having been the first city in the United States to entirely supplant horse drawn patrol wagons with auto patrols. How this system has worked out forms an interesting chapter. Incidentally it has attracted the attention of police officials all over the country, and is being extensively copied.

Two of these auto patrols are stationed at the first precinct signal barn, this precinct including the bulk of the business district and being approximately one mile wide and two miles long. During the first eight months that the original auto patrol was in commission it covered this district with the assistance of a horse drawn wagon. In that period—January 7, 1910, to September 1 of the same year—the auto patrol responded to 4,203 calls, with a total mileage of 11,163. Up to 11.22 A. M., January 31, 1911, it registered a total mileage of 15,897, an average of 40 miles every day since it went into commission.

During the first eight months of service a detailed statement of cost was compiled by the department, running expenses being as follows:

Oil and gasoline	$225.45
New tires	281.10
Repairs for tires	180.60
Other repairs	44.70
Total	$731.85

So much for running expenses. The significant part of the statement lies in the comparative cost of the same service under the old plan, as furnished by Captain Lemuel Guyman, superintendent of equipment. To do the same amount of work, according to Captain Guyman, it would require two patrol wagons, twelve horses, four patrolmen in addition to the number required to operate the auto patrol, and one hostler. Under this arrangement the cost would be:

Twelve horses	$ 888.00
Four patrolmen	2,666.66
One hostler	440.00
Total	$3,994.66

This leaves for the eight month period covered a saving in favor of the auto patrol of $3,262.81, or more than half the purchase price of an outfit. It will be noticed also that in the latter computation no account is taken of repairs to patrol wagons, which, however light, is a legitimate charge in such a comparison.

That is only part of the story of how auto patrols have revolutionized Detroit's police department.

These auto patrols have almost entirely supplanted ambulances. They are speedier, can be obtained on the instant, and provide every facility. Each auto patrol carries jacks for lifting a street car from the tracks and releasing the victim of an accident, fire lines for roping off streets, ropes for lowering persons from a building, tow ropes for use in returning stolen autos, a medicine chest with a full equipment, stretcher, blankets, pillows, etc. Every man on the auto patrol is schooled so he knows just what to do in the event of an accident. First aid to the injured instructions form a part of his course.

With these facts in mind, comparison by months of the work of these seven auto patrols possesses added interest. December and January have been selected for this purpose as being typical, and each month is shown separately, so that variations may be noted, the patrols being given under the numbers assigned them in the department.

December.

	Calls.	Miles.	Taken to Hospitals.	Taken Home.	City Physicians.
No. 1....	636	1,425	21	4	1
No. 2....	407	900	9	6	2
No. 3....	122	487	5	3	
No. 4....	169	675	7	4	
No. 6....	341	707	4	3	
No. 7....	339	747	8	6	
No. 9....	133	520	9	4	
	2,246	5,843	65	30	3

For January there was an increase in every respect, as follows:

	Calls.	Miles.	Taken to Hospitals.	Taken Home.	City Physicians.
No. 1....	581	1,158	31	10	10
No. 2....	482	1,005	14	5	3
No. 3....	143	445	10	7	
No. 4....	265	1,140	9	3	
No. 6....	367	798	5	6	
No. 7....	349	791	7		
No. 9....	157	631	11	4	
	2,344	5,968	87	35	13

For January the fuel consumption was as follows, consideration of this showing necessarily having to take into account the fact that this driving was done under hard conditions, where speed counted for everything, and often in congested districts where it was necessary to check down:

Machine.	Gallons.
No. 1	231
2	169
3	85
4	188
7	134
8	141
9	92
10	96

There is still another adjunct to Detroit's police department that is attracting widespread attention. That is the flying squadron, consisting of an Oldsmobile touring car which carries a detective, five patrolmen and a driver. This machine is stationed at police headquarters, and answers emergency calls all over the city day or night. It has been in commission some months, and so successful has it proven that other squadrons will shortly be installed at outlying stations. With this arrangement there is always a reserve force on call, and in the event of a murder, a fire or a burglary the squad has repeatedly demonstrated its value. During January the flying squadron made 135 runs, covering 372 miles, and in so doing consumed 96 gallons of gasoline.

Two years ago the 15th of last October the fire department installed its first flying squadron, consisting of a Packard Thirty fitted with a body that would accommodate twelve men, including the driver. This machine was designed to furnish men to fill in when others in the department were at their meals, and assist in general in fighting fires. So successful did the plan prove that last November another company organized on the same order was placed in service. These cars carry three extinguishers, axes, a life net and a stretcher similar to those on the patrol wagons. They are finished in the regulation department red.

The fire department also has a Webb motor engine, located at the busiest downtown engine house, and a Webb motor hose wagon that carries 1,000 feet of three inch hose, and acts as tender for the fire boats, in addition to filling in at other times. Present plans contemplate the addition of another engine in the near future.

COMMERCIAL CAR LINE FOR LINCOLN COUNTY, GEORGIA

T. M. Nabers, of Washington, and Editor J. H. Boykin, of "The Lincoln Journal," are working together for the organization of a passenger, mail and freight auto truck line connecting Washington and Lincolnton, Georgia.

The absence of any railway facilities in Lincoln County has long stood in the way of Lincoln County's best development and growth, and the auto line is being pushed by both the citizens of Wilkes and Lincoln Counties for the benefits which will accrue to each county. A stock company will be organized, two-thirds of the stock having been pledged by Lincoln County citizens.

LAWRENCE, MASS., USES WHITE TRUCK FOR DUMPING PURPOSES

Cities and towns throughout New England are rapidly taking up the commercial vehicle in different municipal departments. In Lawrence the Health Board has just purchased a three-ton dumping truck from the White Company. The truck is being used to carry rubbish, ashes, etc., from the city streets to the public dump. Lawrence is the first city in the country to employ a dumping truck in this manner, and it is giving such excellent results that the Lawrence people are thinking of purchasing another.

CLEVELAND SUBURB TO HAVE AUTO FIRE ENGINE

East Cleveland, Ohio, is to have an automobile fire engine, the village authorities having sold $20,000 bonds to provide funds with which to purchase the engine and also to install a complete fire and police signal system.

The new auto engine is to be ninety horse power and will be able to travel the village streets as fast as any engine in the country. It will be equipped with everything to make it modern and the village authorities believe it will be of great value to the taxpayers.

Lowell's Motor Police Patrol

THE illustration shows the police patrol built for the city of Lowell, Mass., by the E. R. Thomas Motor Company, of Buffalo, N. Y., who claim it to be the most completely equipped and modern police car ever designed for an American city. The big machine is really a combination first aid car, ambulance and general police conveyance and with its speed and equipment would do credit to a city many times the size of Lowell, which city is leading some of the largest cities throughout the country because of the introduction of motor apparatus in preference to horses.

The city's present apparatus consisting of several pieces in the various city departments, is to be reinforced by others, and it is predicted by city officials that there will not be a single piece of horse drawn apparatus in the town within a few years. Steps toward this end are being taken in every direction. Mayor John F. Meehan, of Lowell, and the mayors of other towns, including the various city officials have investigated thoroughly, going into the details of maintenance, showing the motor vehicle costs incomparably less. They took up the life of a horse, the cost of repairs, the feed bill, bedding, veterinary service, shoeing, etc., and demonstrated a saving to the city that interests tax payers. From experience with cars of this description, it was soon proven that there was no comparison in the result either in the cost of upkeep or efficiency between automobiles and horses, and they have been a great success from the start, as it is the means of carrying the officers to any part of the city, frequently some miles away from its starting point, generally reaching their destination before the local horse apparatus would be able to arrive at the turning point. Those who have had experience in their operation unite in agreeing that there is only one side to the question of automobile versus horse apparatus, and that, the automobile side. This is particularly advantageous during the winter months when the snow-falls are heavy and it is almost impossible for horse drawn vehicles to respond to calls, and if they start are exhausted on their return, where the motor car can get away on the succeeding calls with equal quickness to the scene of the trouble. The horse is rendered less efficient by heat and cold, it is susceptible to poor service, and police chiefs say their release from all fire and police service will be an act of humanity.

Lowell's Motor Police Patrol

The city of Lowell started in with a single piece of motor apparatus, tried it out to the satisfaction that the principle was right, then purchased additional pieces and tried these out in turn. Satisfaction being assured, more pieces will be tried out and more added, until some day the city will stand high in the number and efficient distribution of its motor equipment.

The new Police Patrol is built on a six cylinder, 70 horsepower chassis and is one of the largest machines ever turned out by the E. R. Thomas factory. The two narrow windows on each side and two larger ones in the front furnish ventilation when the rear door is closed. The interior is lighted by a dome light in the roof. Two seats running the length of the car and fitted with ambulance rails will accommodate ten people. The seats are constructed so that when the rails are in use the seats can be converted into cots.

The running boards on each side are built as chests. A large one accommodates two automatic riot guns, four automatic pistols, six pairs of handcuffs and twisters. A large medicine case and a copper tank for remedy for burns is also built in the running boards. Cases for stretchers open from the rear of the car and a powerful searchlight is built in front to be operated by the driver. The car has a wheel base of 144¾ inches, and will comfortably carry fifteen people. It is painted dark green and lettered in gold.

A NEW WAVERLEY AMBULANCE

The Waverley Co., of Indianapolis, Ind., has turned out a new type of electric ambulance for B. A. Spring, of Grand Rapids, Mich. This is 13½ feet in length over all by 4 feet wide and something more than 8½ feet high. The inside length is 8 feet 4 inches, height 5 feet 8 inches and width 3 feet 6 inches. The exterior is finished in a neutral gray and the interior upholstered in goat morocco. A folding couch occupies one half of the car and on the opposite side are three folding seats for attendants. The ambulance is provided with both rear and side doors, plate glass windows and screened ventilators. It is equipped with electric lights, electric heater, removable stretcher with mattress, surgical basin and other useful appliances.

Buffalo Police Commissioners claim that with two additional motor patrol wagons to the one now in use, they would be able to dispense with the seven horse-drawn vehicles now in service.

WESTERN RESERVE TAKES OVER GARFORD, IN CLEVELAND

The Western Reserve Motor Car Company, No. 6604-6618 Euclid avenue, Cleveland, Ohio, has taken over the business of the Garford Motor Truck Company, of Cleveland. R. P. Kinney will continue as manager of the truck department and will also have charge of the Pierce Arrow truck sales, the Western Reserve Company being the Cleveland agents for this commercial car.

NEW SERVICE BUILDING FOR THE WHITE COMPANY

One of the first of the New York automobile concerns to recognize the necessity for a service building especially adapted for motor trucks, the White Company have disposed of their service building on West End avenue, and have acquired a large plot of ground on West 57th street where they will immediately construct a building especially designed for the economical handling of motor trucks. The plot secured by The White Company is on the north side of 57th street, between 11th and 12th avenue, and is of 250 feet frontage by 100 feet in depth, this being the largest area occupied by any building in the city devoted to automobile purposes.

LOZIER TO BUILD IN CLEVELAND

Plans are now under way for the erection of a new Lozier branch and service building in the down-town section of Cleveland. At present the concern is temporarily quartered at 6010-12 Euclid avenue. W. H. Kirkpatrick, formerly identified with the Peerless Motor Car Company, is manager. The new building, the site for which has not yet been decided upon, will house both pleasure and commercial cars. The organization will also embrace a service department.

Gratifying results have followed the opening of the new Lozier temporary branch. The selection of a down town site will be something of a departure since most of the motor car business is scattered along Euclid avenue. The new branch was opened February 16.

NEW COLGATE GARAGE

Colgate & Company, the well known soap and perfume manufacturers in Jersey City, have planned for immediate building of a garage of up-to-date construction, 100x100, one story in height. A fleet of Hewitt trucks will be stored and cared for in the new building, which is to be erected near the plant of the concern.

E. B. Pfost, sales manager for the Seitz Truck Company, closed a deal with W. J. Carter, president of the Overland Auto Company, for the Colorado agency for the Seitz truck.

BENZ AUTO IMPORT COMPANY BECOMES BRANCH

The Benz Auto Import Company, 250 W. 54th street, New York City, well known importers of the Gaggenau trucks, since April first has become a direct branch of the Benz Company, Et Cie, of Mannheim, Germany, this being the parent company controlling both the Gaggenau and Benz factories.

The personnel of the management of the Benz Auto Import Company will not be altered by the new relation with the parent factory. However, A. Maas will act as direct representative of the Benz Company's interest on this side.

J. T. Rainier has been appointed agent for the Garford Company, of Elmira, N. Y., for the territory of New York.

The Consolidated Gas, Electric Light & Power Co., of Baltimore, are building a new garage especially for electric vehicles, at No. 30 S. Eutaw street.

The Ellis Motor Car Co., agents for the Pierce-Arrow trucks, are having a new building constructed at Central avenue and Second street, Newark, N. J.

Christian Feigenspan Corporation, of Newark, N. J., are building a new brewery garage at 266-270 Passaic avenue, 76 x 115 feet. They have in use three 6 ton Rapids, two seven ton Hewitts, and have placed orders for two Alco and two Knox machines.

The Davies Commercial Car Co. was recently incorporated in Chicago, and has temporarily located at 1413 Michigan Ave., where the Mais truck will be displayed. W. T. Davies, F. W. Van Sicklen and Chas. A. Coey are interested in the new company.

Eccles & Smith, of San Francisco, has taken over the agency of the Little Giant truck, manufactured by the Chicago Pneumatic Tool Company. The new car is a 24 h. p. delivery wagon and has a carrying capacity of 2,000 to 2,500 pounds. It is rated at 10 to 20 miles an hour. The agents are to get a liberal allotment of these vehicles and plan an energetic selling campaign throughout the State.

The Torbensen Truck Co., which has its works at Bloomfield, N. J., has established a garage at 48-50 Orange street, Newark, N. J. R. G. Schultz has been placed in charge of it and also has the State agency for these machines. The 1½ ton truck made by this company employs a shaft drive with a one piece dead rear axle. The axle proper, which carries the load is of I-beam of extraordinary stiffness and strength, yet comparatively light in weight. It carries as a component part of it the jack shaft with its differential and driving gears, enclosed in dust proof casings and driving direct to the hub of the wheels.

The Truck Salesmen

When there came into the industry another field, the production of the motor car for carrying not men, but freight, a new type of salesman was required. Freight is essentially different from men, and must have different treatment. In the first place it lacks the fine discrimination which prefers the handsome touring car to the more sedate horse. Freight handled in a motor truck is not worth a dollar more than freight handled in a lumber wagon. In most cases cost and cost only must determine the method of transportation. Then again speed becomes less of a factor. Not "how fast," but "how much in a day." Again, while the passenger steps nimbly to the running board, and seats himself on the cushions, freight requires time and muscle for loading and unloading. Interest and depreciation pursue their reasonable but merciless course during the hours of preparation and the hours of travel alike. All these factors, though they apply generally to motor transportation, vary with different lines of business and different service. How well designers have met the demands is evidenced by the thousands of motor trucks in use today, and by the business houses who have used them for three or four years, and are now adding to their equipment.

The commercial car has brought into the industry a new want. There must be salesmen who can understand not only the possibilities of their vehicle, but the details of the work it is expected to do. They must be analysts—expert diagnosticians, who can prescribe for the business man precisely the type of vehicle that can do his work successfully. This is a calling that involves more than a knowledge of body lines and "class." The matter of carburetors and crank shaft bearings sinks into obscurity beside the question of long hauls and short hauls, non-paying mileage and upkeep. The designer of the commercial vehicle must take his knowledge of its work to some extent second-hand—he cannot take his car out on the road, and determine from its performance whether or not it will save money for the dry goods merchant in the delivery of his goods. The salesman becomes more important than ever before as a connecting link between the manufacturer and the customer. He must learn what work is to be done before he can intelligently offer to the prospective purchaser the proper equipment for doing it.

What The Truck Salesmen Should Know

The leading grocer in a western town of 25,000 has a touring car which he bought three years ago. When he purchased it he did not take a demonstration, he selected the car because he knew of several of the same model that were owned by his friends and giving good service. He has used the car ever since without regretting his choice. He knew at the start that the service he would require of the car was the same that other users did. Two years later he decided to try out a motor delivery wagon. He had no such knowledge from which to judge. He therefore put the car in service for a few days and watched it closely. The automobile salesman who was conducting the trial talked knowingly of ignition systems and convincingly of chain drives, but did not know how much gasoline the motor used while running idle. He utterly failed to show where he could deliver more goods for one dollar than could be handled by horses and wagons, and what was worse, he failed to analyze the merchant's delivery system and find out whether or not it could be rearranged to fit the proposed equipment. The merchant is still using horses. There are thousands of him, and there is room in the ranks for more salesmen of the type suggested. They will do much toward taking the power which saws the farmer's wood, propels our launches and drives our automobiles, and applying it to the transportation of our merchandise.

TRUCK DON'TS

Don't run a truck twenty-four hours a day. Allow the operator at least an hour to go over the machine and attend to the oiling.

Don't overload the truck. If you need a ten ton truck one rated at three will not do the work.

Don't hire a discharged truck driver. Your machine is just as good as the other fellow's.

Don't underpay a truck driver. A cheap operator is an expensive luxury.

Don't expect an operator to do round-house work on his own time.

Don't put too many stops on one trip. A truck driver requires food and can't afford thermos bottles.

Don't employ a driver who drinks. The machine may send him where he belongs, but it won't take him home.

Don't believe all things a chauffeur tells you. The quacks do the most advertising.

Don't think you are the only one who has been offered a concession in buying a machine. Some firms have been given a body in addition to the truck.

Don't buy a truck because it's cheap. The most-used pleasure car ever built does not see the service of an ordinary truck engine.

Don't overpay a truck driver. Some day he will lay off to spend the money.

LINES JOINS WESTERN RESERVE

C. M. Lines has joined the Western Reserve Motor Car Company organization at No. 6604-6618 Euclid avenue, Cleveland, Ohio, as vice-president and assistant general manager. Mr. Lines was formerly identified with the Standard Automobile Company, of Cleveland, agents for the Packard, having been with that concern for the past five years.

As an illustration of the growth of the commercial truck business it is interesting to note that there are 90 manufacturers of gasoline trucks with capacity rated from 500 to 1,500 pounds; 65 who make them to carry from 2,000 to 3,000 pounds; 33 companies making 2-ton to 2½-ton trucks, and 43 whose product is rated 6,000 pounds; 11 of 4-ton capacity, and 24 of 5-ton, while six companies have trucks rated at six tons and over.

The Overloading Abuse and a Suggested Remedy

BY E. S. FOLJAMBE

PERSONS who have to do with the care and maintenance of a delivery system by commercial cars, are well aware of the rapid deterioration of the entire truck mechanism wherever machines are habitually overloaded. It is true that some of the wise manufacturers are intentionally under-rating the capacity of their machines with a view to prevent this flagrant abuse.

Nevertheless, the machines continue to be overloaded, as the average driver is more or less irresponsible and in almost all cases, not personally interested. He also is well aware of the fact that nearly all commercial cars are capable of carrying much more than their rated capacity. He simply piles on the goods which must be delivered. Usually, the total weight is the last thing he thinks of, and even if he does seriously consider it, he has no means of knowing exactly the load that is on the truck and must judge by a superficial inspection or by looking at the springs. There are many times when overloading is simply a matter of ignorance, there being no premeditated intention of putting on everything at once in order to damage the machines, although even such cases as this are unfortunately on record. As a rule the driver takes as much as can be stowed in such a way that it will "Ride." The load is piled as high as is safe, it being well known that the motor is able to pull all that can be placed on the body. Of course, this is not true of pig iron, machinery and heavy freight, but where the material carried is in parcels, or packages of moderate weight each, the amount carried is usually that which will ride without falling off.

Some Results of Overloading

It seems hardly necessary to go into the details of the results of continually overloading a motor truck, yet some of the many important dangers should be pointed out, especially for the benefit of those who have but recently installed their machines.

In the first place, one of the largest items of expense in any commercial car service is that of tires. If any one part of a machine shows more quickly the effects of overloading than another, it is the tires. A moderately loaded machine will go trip after trip, the tires showing very little depreciation, while a similar car which, however, is always overloaded will be constantly having tire trouble. The tires will show great gashes, and seem to be mysteriously cut, going over some road that the other machine passes over without the tires receiving any material damage. When driving in the car tracks, chunks of the side of the tires will be ripped out and it will be noticed that the tires on the particular car in question seem to be going to pieces very much faster than they should. It even happens that a superficial report may be sent out that the tires on truck No. 2 or 3 are not up to the standard and the matter may even go so far as to reach the tire maker or dealer from whom the purchase was made.

It is not alone the tires, however, which immediately show deterioration due to excessive loads; every part of the mechanism of the machine begins to wear abnormally. Looseness appears where the parts should remain tight for many months; there will be unusual rattling, squeaking, etc. The steering connections will show an excessive amount of back lash, truss rods will snap off at the threads and other parts will mysteriously break, many times while running on a perfectly smooth piece of road. Again, the uninitiated is apt to attribute these mysterious breaks to flaws or poor material, while in reality, they are due directly to the excessive strains brought about by the tremendous loads heaped upon the poor resistless piece of mechanism.

The springs are now made of unusually good materials, and can stand an amount of abuse that is really astonishing, yet these in time succumb to the over burden brought about by excessive loads. Clips work loose, the shackles seem to wear more rapidly than they should, and occasionally a spring leaf will snap, sometimes causing other breaks.

Even the frame is affected, and if made of pressed steel, sometimes actually cracks at some point where there may perhaps be too many bolt or rivet holes near the top or bottom where its fibres are under greatest stress.

Owing to the excessive weight carried, the jarring of the entire mechanism is greatly increased, gasoline tanks spring a leak, the lamps fall apart and even the engine develops symptoms which may be laid to all kinds of erroneous causes, the man in charge not recognizing that these are all symptoms of overloading.

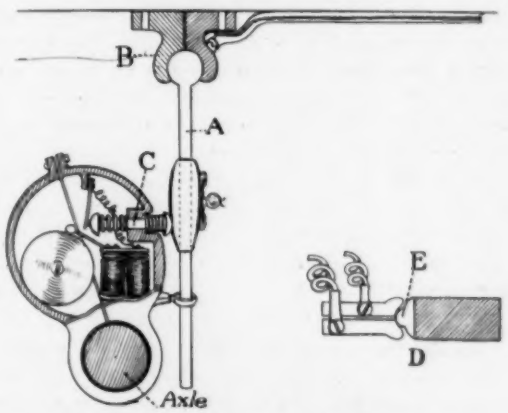
A Suggestive Remedy

So far as is known to the writer, nothing definite has yet been done to prevent the overloading abuse. That this can be done is not difficult to show and the remedy here suggested, although not worked out in detail, is sufficiently clear to enable an ingenious mechanic to arrange such a device on a practical basis, and there are undoubtedly many other ways in which the same results can be accomplished. In some cases, unfortunately, preventive measures will have to be taken against the malicious overloading of the machines, in which case the device here suggested would have to be modified so that it could not be tampered with. However, the

construction as shown in the accompanying sketch can readily be modified to take care of such conditions, but is, as here shown, simply intended to act as a warning, giving the driver or the traffic manager notice that the machine is being overloaded.

Referring to the accompanying sketch, it will be seen that the device consists simply of placing on the rear axle a pressed steel or other divided case, containing a good sized electric bell, which is intended to ring whenever the weight upon the truck reaches any predetermined amount for which the device is set. The operation of the mechanism is as follows:

The rod A, fitted with a ball end, rests in a socket B, attached to the under side of the body at a suitable place near one of the rear springs. Upon this rod is clamped a kind of projecting piece which acts as a cam to operate an electric contact button. As will be seen, this piece is adjustable on



Device Suggested for Preventing Overloading

the rod A, thereby giving a means of setting it so that the bell will be operated at say, two hundred pounds less than the maximum load; or any other amount desirable, so as to give timely warning. As the load on the truck body is increasing, the compression on the rear springs allows rod A to be pushed lower and lower until finally the adjustable stop forces pin C inward, making an electrical contact within the box, when the bell will begin to ring, and will continue to ring until the current is cut off at some point in the line. This may be done in several ways. For instance where employees can be trusted, by means of a suitable switch directly on the box, the device simply being used as a warning for their information. However, when dealing with irresponsible drivers, other measures will have to be taken, such as having the switch locked, to be opened by the man in charge of loading, in which case it might be well to arrange the stop so that the bell will not ring until the maximum load has been slightly exceeded. It will then, of course, be to the interest of the driver not to have the inspector's special attention called to him by loading the truck to such a point that the bell will ring. At D, again referring to the sketch, is shown a section of the change speed gear lever, which could be made to form a break in the current whenever it is in any of the speeds, but would complete the circuit when in a neutral position. This arrangement would automatically provide a means by which the bell would be inoperative whenever the truck was on the road, and the gear shift lever in any other position than neutral. Current could be supplied by the ignition storage battery or by dry cells.

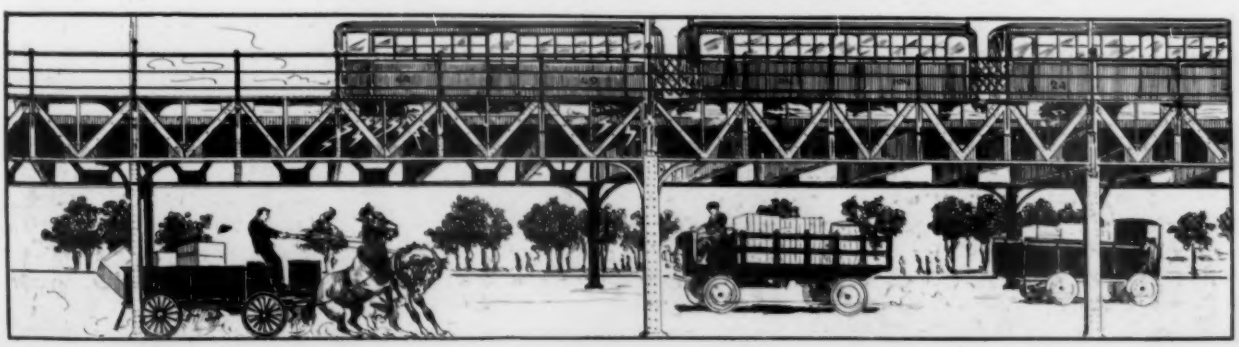
It must be remembered that these are made simply as suggestions, to be worked out for individual cases by those in charge of such work. The wires could be run from the gear shift lever to the block B, at the rear of the truck through a piece of metal piping, and be so attached to the gear shift lever in cases of necessity, so that the parts could be sealed, so that any tampering with them would show. In a similar way the screws of the movable stop, after once being adjusted, could be drilled and wires passed through to hold the adjustment. At the same time the ends of these wires could be fitted with a small lead seal so that the adjustment could not be changed without this showing. But these are details which can be worked out by the users for each individual case.

It is certain that something must be done in the near future to prevent the excessive overloading of commercial cars, as it now seems to be almost universal. No matter what the carrying capacity of a truck may be, more is put upon it. In one instance a small 2000 lb. truck was actually made to carry 4500 lbs. of plates and ice cream to a drivers' picnic. It is needless to say the truck was practically ruined. Similar cases are being noted daily by truck dealers.

It is of very little use for a maker to turn out a truck which is capable of carrying five tons and call it a three ton truck, while at the same time he widely announces the fact that it will really carry five tons satisfactorily. If the truck is properly built and has five tons capacity, he will of necessity have to charge about the same as any other manufacturer does for his five ton vehicle, and it will be but a short time before five and a half and then six tons will be placed on it.

In view of the very unsatisfactory results which immediately follow excessive overloading, it is to be hoped that mechanical means may be provided to prevent this flagrant and almost universal abuse of the motor truck.

Any suggestions for such devices or opinions concerning methods of preventing such overloading will be gladly received by this publication.



Commercial Car Depreciation From the User's Standpoint

BY WILLIAM J. JOHNSON

COMMERCIAL car depreciation from the user's point of view is something of an unknown quantity for the reason that many owners do not consider the subject at all.

Manufacturers of motor trucks state that their cars will last four, five or ten years and that depreciation should not exceed 10, 15, 20 or 25 per cent. In some services 10 per cent. will be ample, in others 15 or more. There are some cases where depreciation is charged at 50 per cent. due to the peculiar ideas entertained by the owners as to what should constitute depreciation.

Users Indifferent

Many users of commercial cars are decidedly indifferent on the subject of depreciation and, taking the field as a whole, the matter is hardly considered. Since with the user, the motor truck in many instances is an innovation, this may reasonably be expected. It is common knowledge that commercial cars have been in some services for years and given very good results where properly maintained, and even in such services as the treatment has been indifferent the cars have done wonderfully well.

The writer has spent much time among the owners and users of commercial cars, and it is safe to assert that not ten per cent. of the users have any idea what depreciation amounts to. Whether the service is economical many do not know, they pay the bills and that ends the matter.

An owner of a three ton truck when questioned about depreciation said he never thought of the matter in that light, he used his cars, paid the bills when they came in and the cars were on the move pretty much all the time and he could do things with them he would never attempt with horses. He realized that he needed a record system and contemplated one in the very near future.

Another user said that he did not have time to keep track of the work of the cars, he had other things to do. He could not follow around the drivers to ascertain whether they drove too fast. The agent of the cars repaired them, he settled with the agent.

Other cases are on record where things are done differently, where the users realize that proper care of the vehicles is necessary.

Overrating Depreciation

Another feature of the individual estimate of commercial car depreciation is that many users overrate, this being done simply as a safeguard. A case in point. The user of a fleet of gas cars charged them off at 50 per cent. From his own statement 25 per cent. would have been ample, but he overrated to be on the safe side and said that he probably would not charge off anything for the second year, the vehicles now having been in service nearly all of the year for which 50 per cent. was charged off. The three ton trucks used in this service are employed in long distance hauls and the owner states that he could not cope with the growth of his business were it not for the commercial motor equipment which has built up his trade.

Differences of Opinion

Very few users regard depreciation in the same light. For example, the user of a three ton gas truck includes in the depreciation account a special body equipment. He maintains a separate maintenance account and because of the liability of the body to damage estimates depreciation at 25 per cent.

According to his own statement the car is constantly overloaded 50 per cent.

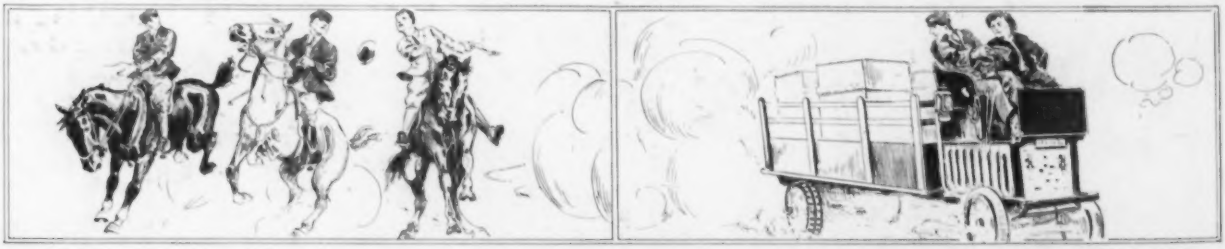
Long Life Essential

The probable life of a motor truck from the manufacturer's point of view varies from five years upwards and, in order to make an installation really valuable, it is essential that the vehicle last more than three years. One user stated that if the car did not last more than three years it was useless and that if he thought it would not wear more than three years he would dispose of it now. In this particular service the commercial equipment is especially valuable for the reason that long hauls can be economically made in competition with the railroads.

The life of a truck of course influences depreciation and in such cases as owners charge off at high rates, the vehicle being serviceable after that time they may then be regarded as being operated at very slight expense, in that they have been fully paid for and are virtually no expense.

Marked Absence of Record

It is to be noted that many users of commercial cars deem it too much fuss to maintain a vehicle record, this point was forcibly impressed on the writer. There was a marked absence of definite record, a user might know what it cost in a lump sum to maintain a car, but as to what each feature of the account demanded, he did not know and could only ascertain after much calculation, and he hardly felt he had the time to do that. Some figure that as long as the trucks give service and they can easily meet the bills, why keep a record. Assured up to a certain point, which is that the commercial



cars are better than horses, a large majority of users will not keep records although admitting that it would improve things materially.

After a session or two on repair accounts the necessity of record is impressed on the user, but, even then he defers the matter to some future time.

Results of Operation

The uninitiated user of a commercial car has many things to learn, not the least important of which is the necessity of doing things properly. After he has received a few bills he begins to think and can arrive at some definite idea of what his service amounts to and if it is costing too much. Very naturally in the course of discussions with the manufacturer, agent of the car or with other users, he acquires some idea of where the leak may be and sets about to close it.

In various cases known to the writer, owners have stated frankly they were not doing things right, that their system was wrong. In some of these, private garages are contemplated as a means of acquiring better service at lower cost.

It is noteworthy that even in those cases where depreciation is charged off at high rates, where the depreciation is actually in excess of what it should be, the service rendered by commercial car equipment is so much superior to horse service that the continuance of the vehicles is imperative, as an out and out dollars and cents proposition. The same work could not be done at the same cost with horse equipment especially in long hauls. It must be borne in mind, too, that many owners of horses charge them off at 25 per cent. depreciation, and when a horse drops he is gone, whereas a commercial car must be a complete wreck before it becomes useless. Horses to-day, too, are much more expensive than two years back.

One owner of both cars and horses stated that he had so built up his business with commercial equipment that he could not do without the cars, they were a valuable asset and for that reason he could charge off depreciation at a high rate; he could well afford to do it, he said. His estimation of depreciation was double what it really amounted to.

What Some Users Say

It would appear, from such concerns as do charge off depreciation, that 20 per cent. is a fair average under hard conditions, taking into consideration all classes of service.

One good service illustration will serve as well as a dozen. In the city of Detroit, the hub of the motoring universe and the home of various makes of commercial cars, service conditions are hard, especially in the outlying sections where improved paving is minus.

The Leonard Reliable Storage Company maintains two three-ton gas trucks which are used throughout the city, and in reaching remote points, mileage being anywhere from 30 to 100 miles a day. The record day's work here is 100 miles, which included two calls to Pontiac and return. The owner states that the car is overloaded and he consequently figures depreciation at 25 per cent.

The Ireland & Matthews Manufacturing Company employ a three ton gas truck which in ten months of service traveled 5740 miles. The vehicle is used throughout the city and is kept on the go pretty much all the time. Depreciation here is figured at 20 per cent.

The Edison Illuminating Company use a fleet of electrics, the largest of which is five tons, this latter being used chiefly for hauling coal. The large car averages about 15,000 miles a year, the smaller vehicle about 10,000 miles a year. Ten per cent. is the estimation here.

J. A. Mercier, a coal dealer, is using three electric five ton trucks averaging about 50 miles a day. Ten per cent. he states will cover the depreciation.

Towar's Wayne County Creamery uses a three ton gas truck and five single cylinder gasoline delivery wagons. Fifteen per cent. will cover depreciation here. The large vehicle is in service from 4 A. M. until 6 P. M., two men being in charge, who deliver bottled goods about the city to various groceries. Later in the day the car is used to deliver goods to sub-stations of the concern.

While no definite figures are given out by the Tivoli brewery, where seven gasoline vehicles are in service, good results are being obtained at fairly moderate depreciation. The 3 ton truck, the largest in use, very often delivers bottled goods to Pontiac, Wyandotte and other towns surrounding Detroit, Mich. The statement is here made that the three ton vehicle is operated at a repair cost of 26 cents a day, average monthly mileage being about 1000. The smaller cars average 35 miles a day.

Parke Davis & Company is another concern firmly believing in the efficacy of the commercial car. No definite figures are here given on depreciation, though it is said to be moderate. A one ton electric car used by the company has been driven 35,000 miles and averages about 30 miles a day. A one ton gasoline delivery wagon averages about the same mileage. The service is to be increased shortly and a building is being remodeled for a garage to accommodate fifteen cars.

The Michigan Stove Works, using a three ton gas commercial car, has had excellent service, and while no attempt has been made to keep an accurate record of depreciation and the like, the item is low.

INSTRUCTIVE EXPERIENCES

COMMERCIAL CAR IN COMPETITION WITH RAILROAD

It is well known that for certain classes of hauling between points within 75 to 150 miles apart the commercial car can do the work with greater facility and in far shorter time than the railroad.

This does not mean that the truck must make 30 to 35 miles an hour, or that in actual speed on the road, the truck must out-distance the train. The advantage in time is due to the fact that the method is so much more direct, there being but one loading onto the truck and one unloading at the point of destination, as against six handlings by the railroad method. A striking example of the use of a motor truck for such service was that of the demonstration of a Commer truck between Wanamaker's New York and Philadelphia stores. Wyckoff, Church and Partridge, of 1743 Broadway, New York City, agents for the Commer trucks and Guy Vaughan cars, on Friday, the 7th of April, decided to show what could be done in this respect by a modern motor truck. A full load of boxed and crated goods was taken on the big machine at Wanamaker's, New York, and at 4.30 A. M. the truck started on its 110 mile trip to Wanamaker's, Philadelphia. It was accompanied by officials of the Wyckoff, Church & Partridge Company in a Guy Vaughan car as pilot. The trip was made entirely with success in a little less than seven hours, including all stops. A reading of the instrument showed exactly 109 miles when the ferry at Camden was reached at about 11 o'clock in the morning. This makes an average speed of about 16 6-10 miles per hour, which it is claimed can be maintained by these machines without damage. While proceeding up Market street to the Wanamaker store the impatience of the driver could hardly be contained when he was stopped by a "fat-headed police," as he expressed it, for driving too fast.

Commer Truck After Arriving at Wanamaker's, Philadelphia

This view shows the Commer Truck after unloading at Wanamaker's store, Philadelphia, at 11 A. M., a load of freight which it took on at Wanamaker's New York store at 4.30 the same morning. The trip of 109 miles was made in seven hours, the goods being carried between the two stores in less than half the time which would have been taken had they been carried by the railroad, which would have required six handlings of the goods instead of two.

The trip was made on 21 gallons of gasoline, which is about 5¼ miles to the gallon, not a bad showing for such a large truck fully loaded. As soon as the goods were delivered the truck proceeded to the Wanamaker storage house, 19th and Market streets, and took on a load of furniture to be returned to New York, and at 2.15 P. M. started on the return trip. It arrived at Wyckoff, Church and Partridge's at exactly 9.15 P. M., making 7 hours on the road, just the same running time as on the outgoing trip. Taken altogether this demonstration was unique, the running being very consistent, and the results conclusive.

MOTOR TRUCK HAULS TURPENTINE

Hauling spirits of turpentine and rosin by motor truck is a new feature of the turpentine industry, and some very interesting tests were recently made by the De Land Naval Stores Company. So far as is known this is the first time a motor truck has been used to haul turpentine direct from still to railroad.

The truck used was the standard three-ton White, furnished by the White Automobile Company, of Cleveland, O., for the purpose of determining the adaptability of the truck to haul turpentine and rosin; also to note the effect of a heavily loaded truck on the oyster shell roads.

As a result of the test the roads were not damaged in the least on account of the very liberal width of the truck's double rear tires. In fact, there was not near the depression made by ordinary wagon wheel.

The height of the platform of the truck to the ground at first seemed to be a serious drawback, but it proved to be just about as easy to load as an ordinary wagon, and being on a level with the freight car, it was easier to unload.

The hauls were made from one still to the railroad, two and a half miles apart. Thirty-five minutes were taken for each round trip, the truck hauling three to four tons to the trip. Fifteen barrels of turpentine made up the three tons, and there was room for four tons of rosin on the platform. At that rate the truck was capable of loading one car in half a day, as against the service of six mules for a whole day. At the same rate the truck was capable of loading a car a day from a still seven miles in the country, while at present it takes all day to get sixteen barrels to the railroad, the truck in that case doing the work of eighteen mules.

The total cost of operating the truck, including gasoline, driver and helper, was figured at 3 cents per ton a mile. The total cost of gasoline and oil is about 85 cents per day. As compared with mule drawn wagons the saving was estimated as being over 50 per cent.

PACKARD TRUCKS USED BY LARGE PITTSBURG FURNISHING HOUSE

Spear & Co., a well known furniture firm of Pittsburg, Pa., is another wide-awake concern which is keeping abreast of the times by using the commercial car for its hauling. It is using two specially designed four ton trucks, manufactured by the Packard Motor Car Company. These trucks have been designed for the special needs of the Spear firm.

These monster motor trucks haul almost a carload of furniture and house furnishings in one load. Despite their size, they respond to the wheel, when packed to their utmost capacity, with utmost ease and precision. Control is so perfect that their progress through districts where traffic is most congested is so speedy as to admit of no delays.

BRUSH COMMERCIAL CAR REDUCES EXPENSE OF DELIVERING LAUNDRY

A convincing test of the economy of the light delivery car was made recently by one of the Brush Co.'s agents for a large laundry company. All doubts as to the advantage of the delivery car over the horse drawn equipment were dispelled after a day's demonstration.

The delivery car left the laundry at 7 o'clock in the morning and returned at 3 o'clock in the afternoon, covering thirty-six miles and making 139 stops. No attempt was made for a speed record, and ordinary care was used in collecting and depositing packages of laundry. Three gallons of gasoline were used, averaging but twelve miles to the gallon, due to the fact that fully half the trip was made over unpaved streets, where the mud varied in depth from felloe deep to nearly hub deep in places, necessitating much low speed work.

In handling this same route with the horse it is necessary to leave the laundry at 7 A. M., the first stop being six miles away. At noon a relief wagon is sent out with a second load, which is transferred to the first wagon. The second horse then works all afternoon and returns to the laundry at times varying between 6 and 8 P. M. With the automobile the return trip was made to the laundry for the second load, thus saving the work of an extra horse and driver. Statistics were compiled as follows:

Total cost of operating two horses and wagons in one day, $5.11, including wages for two drivers at $2 per day each; hay and oats for two horses at 75 cents and allowing depreciation at the rate of one cent per mile, or 36 cents. Total cost of operating delivery car, $3.19, including one driver's wages at $2; total operating cost of 47 cents, with depreciation allowed at 2 cents per mile, or 72 cents.

THE COMMERCIAL CAR AT ARCADIA FARMS

The commercial car used at Arcadia Farms, Dutchess Co., N. Y., has grown to be an indispensable part of the farm equipment, and shows how valuable such vehicles are to the farmer, when operated intelligently. The property embraces 1,800 acres, two-thirds of which is under cultivation. The equipment includes modern machinery for farming on a large scale.

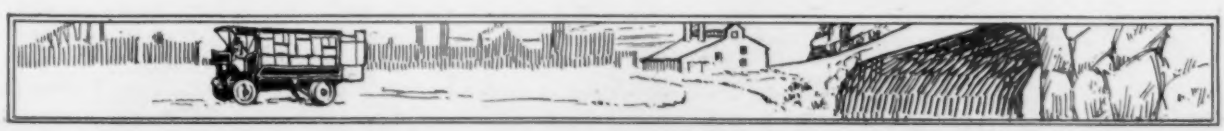
The truck has carried from the railroad station to the farm, a distance of 4 miles, over 1,000 tons of fertilizer, two 10-ton car loads of coal, 2,500 barrels of cement and carloads of various other materials. It has carried five carloads of grain to the station, and transported 600 tons of small stuff. Frequently it has gone to Fishkill Landing, 10 miles distant, twice a day, with heavy loads.

Its short trips are innumerable. It takes grain to the mill and brings back the ground feed. It takes tree trunks to the sawmill and carries back beams and planks. It carries hay or straw, as baled in the field, to the barns or storehouses. It also carries stones to the crusher.

"Not a day has been lost for repairs, and not one cent has been paid out for this purpose," said Mr. Minton. "The expense of operating the truck is about equal to the cost of maintaining two good teams with oats at 60 cents; that is, oats versus gasoline and oil. But no four pairs of horses could carry the loads so far in the same time, if at all."

COMMERCIAL CAR STRAW RIDES

A Philadelphia user of Garford trucks has developed some new ideas in their use, one of the most novel being a motor straw ride. His business is that of expressman between the big city and its suburbs, and he has taught the young people that his power wagons furnish novel hay rides and agreeable picnic excursions. When he used horses he often had to turn away orders for such parties, because his teams seldom were idle during the day and had to rest at night. But now he finds he can work a truck all day and send it out again in the evening without any sentimental compunctions about overworking it.

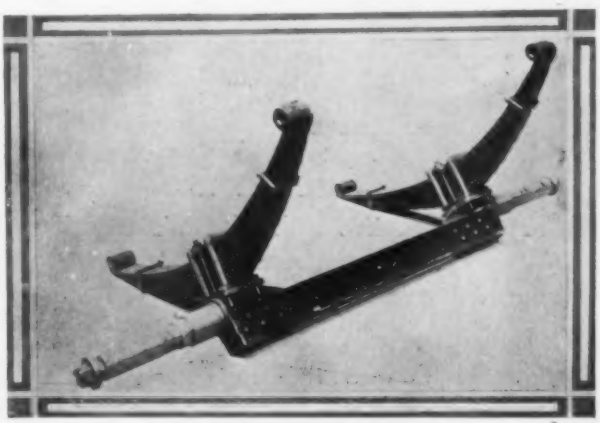


A Leading British Truck—the Lacre

BY FRANK PALMER

LACRE vehicles have achieved a large measure of success amongst the London stores—Whiteley, Schoolbred, Maple, etc.—for the carrying of loads not above 2 tons. For between 3 and 4 years, the Lacre company worked out the whole of their own designs in their own drawing office, but had the vehicles built elsewhere. They now possess their own recently erected factory at the garden city of Letchworth, 45 miles from London and the space, together with the facilities provided there, has enabled the company to develop designs for larger carrying powers. No fewer than 18 models are catalogued, ranging from 10 cwts. capacity up to 5 tons. That large number of different models is not really produced, as it can be well understood that any factory attempting such a policy would soon have to close its doors. After analyzing the horse power and chassis dimensions, the writer is able to reduce the total to the small number of three distinct and different frames, each exactly alike in design in all details, with parts strengthened and increased in size where required, and the following description of the 2 ton capacity truck therefore covers the whole range.

The frame strengths are designed for carrying from 1 ton capacity up to 3 and 5 tons. For the smallest size the standard engine is a two cylinder 12-15 h. p.; for a maximum load of 1½ tons a 2 cylinder 18 h. p. engine is fitted and beyond that, the purchaser can have either a 4 cylinder 30 h. p. engine or a 4 cylinder 38 h. p. engine. In respect to the engines, the differences between the two patterns of a 2 cylinder are only those of the cylinder diameters and in order to reduce the variety of parts to a minimum the 12 h. p. and the 18 h. p. cylinders are arranged to fit on to one type of crank chamber, using the same crankshaft and connecting rods, the holding down bolts for the cylinders falling in the same positions. The same remarks apply to the two types of 4 cylinder, and a still further reduction of parts to be separately machined is secured by the fact that valve sizes and springs, connecting rods, bearing cases, valve caps; timing gears and sundry other details are the same throughout the four engines. Again, the 2 or 3 tons frame, specifically designed for enough space between dashboard and forward end of frame to carry a 4 cylinder engine is utilized for a 2 cylinder by simply setting radiator nearer to the dashboard; this leaves a gap—on the 2 cylinder engine patterns of close upon 18 inches—from forward end of spring to radiator. The effect of course is not elegant, yet it has its advantages in preventing the radiator from being damaged amongst traffic in case a horse vehicle is backed without warning, the blunt ends of the frame then acting as buffers.



Lacre Rear Axle and Springs

The Springs and Axle of the five ton Lacre. A circular solid axle is used up to two tons.

A Monster Chain Case

One of the Lacre oil-tight Chain Cases used on the Lacre Trucks.

So far as concerns the technical features of engine and transmission, the layout is typical of ordinary practice, the whole construction being a straightforward engineering job, schemed for employment of the fewest possible parts and never losing sight for a moment of the desirability of making every portion quite accessible. The key note of the whole design recognizes the necessity for regular overhauling and adjustments in the garage, and that the average driver is best confined to his job and should not be allowed to undertake repairs by the roadside. For the same reason, the driving control is brought down to the simplest possible elements of clutch and brake pedals, side lever gate change gear, side

lever brakes and throttle lever, and as the ignition movement of the high tension magneto is fixed and lubrication from engine is quite automatic, an experienced or even a skilled driver is not required.

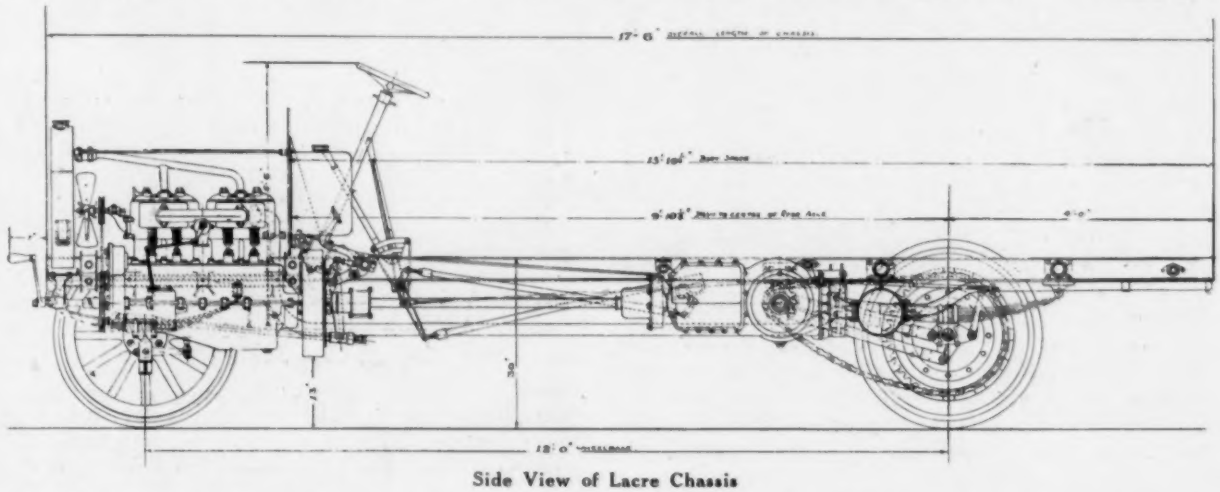
Ordinary Drivers Used

There are some hundreds of Lacre trucks in use in London and the big provincial cities, and most all the drivers have been transferred from the discarded horsed vehicles belonging to the same firms that now own the motor trucks. All models are standardized to run on solid rubber tires and under these conditions it would be simply asking for trouble to let any ordinary driver play about with a 30 h. p. engine, particularly when without any load on the vehicle. To obviate such an occurrence, speed is minimized by fitting a governor to the throttle, worked from inside the crank chamber that cannot be touched unless the lower half of the crankcase is detached. For each type, the gear ratio between engine and road wheel is calculated for maximum speeds on top gear, and "over-driving" is thus rendered impossible.

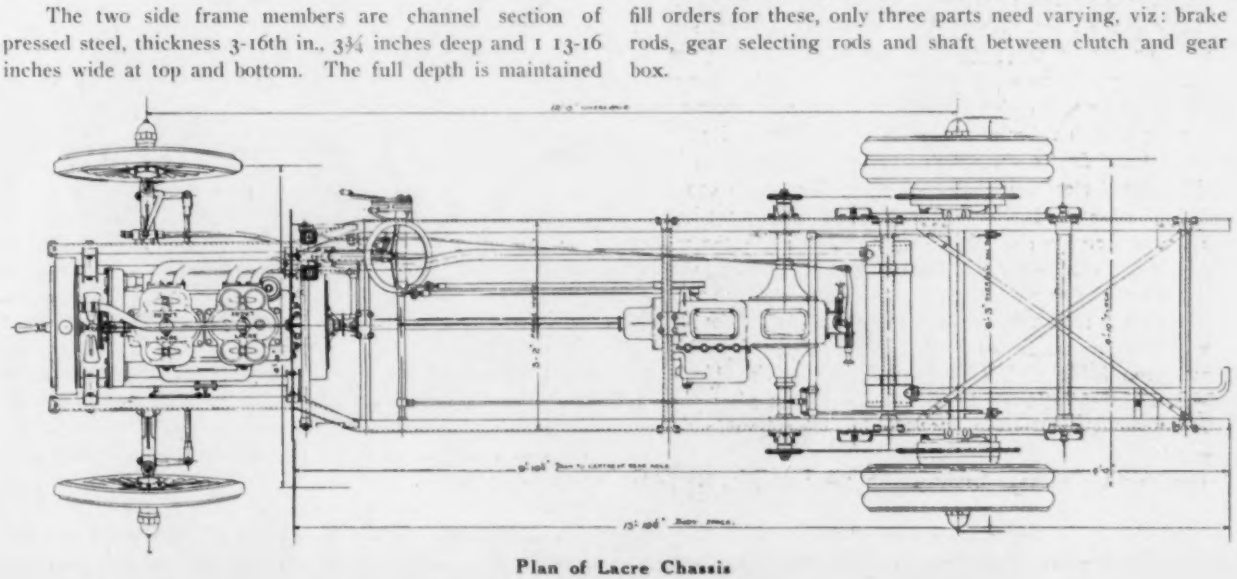
The details following are for the 2 ton model.

The Frame

The two side frame members are channel section of pressed steel, thickness 3-16th in., 3¼ inches deep and 1 13-16 inches wide at top and bottom. The full depth is maintained for the whole length from end to end and both members run parallel to within 4 inches of the dashboard, where they are inswept 2 inches to provide ample turning movement of the front wheels. The stiffeners consist of 7 large diameter weldless steel tubes, that also act as supports for the gear box and for the one nearest the dashboard to carry the fulcrum points for the pedals and clutch fork. A small sub-frame, just long enough to carry the engine, is suspended from a pair of flat pressed steel plates beneath the bonnet. The tubular cross stays are threaded at their exterior ends and screw into steel shoulder plates with wide flanges, these latter being riveted to the side members. This peculiar arrangement has two objects—(1) to allow for minute variations that always exist in heavy pressed steel side frame members and avoid "packing" the gaps with pieces of metal that are never the correct thickness; (2) very many orders are received for extra wide chassis, ranging between 2 and 18 inches beyond the standard sizes, and as the tubes are cut to length and screw threaded at the factory, any width of chassis is easily built up. This does not affect the front flat stays because all the frames are equally inswept. There are 6 standard lengths of wheel base, from 8 ft. 3 ins. up to 13 ft. 6 ins., and to save trouble to fill orders for these, only three parts need varying, viz: brake rods, gear selecting rods and shaft between clutch and gear box.



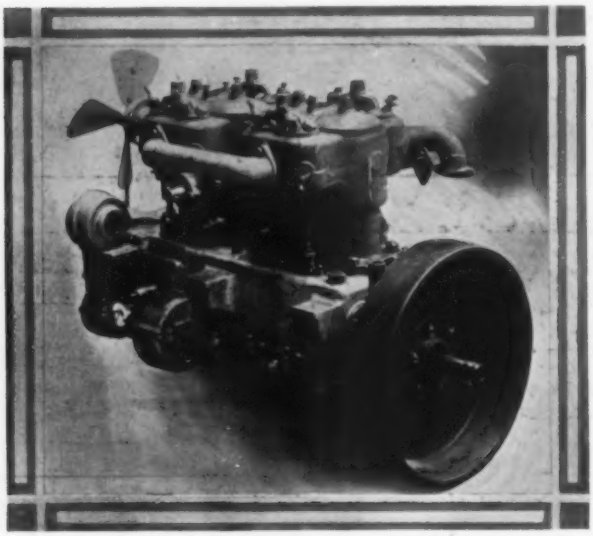
Side View of Lacre Chassis



Plan of Lacre Chassis

Springs

The front springs are half elliptic, somewhat deeply cambered, composed of 6 leaves, the upper and longest one measuring 36 inches; these are mounted on platforms integral with the front axle by central eye bolts and steel clips, the latter passing through holes in the platforms and retained by nuts and castellated lock nuts. Dumb irons are not employed at the fore end of these front springs; instead, the eyes of the springs are carried upon hardened steel bolts



Lacre Motor

Four cylinders, 30 H. P.; cylinders cast in pairs. Note the yokes holding the priming cup and spark plug caps. This motor has a governor inside the crank case.

mounted in machined steel blocks that are riveted to the flat webs of the main side frame members. The tail ends of the springs are carried by single shackles with hardened steel bushes moving upon hardened steel pins, shackles standing vertically when the machine is at rest.

Rear springs have 8 leaves, longest one 42 inches, and are attached to the round solid steel rear axle in the same manner as those at the front. Most all the troubles with rear springs on heavy motor wagons come from the usual types of shackles that take on a permanent twist or quickly wear away the most substantial shackle pins. The Lacre system discards shackles in favor of a simple yet effective device that is quite successful. To the under webs of the frame, machined and hardened steel blocks are bolted, within which can slide steel blocks formed similarly to a lathe saddle, the lower faces of the blocks carrying the hardened pins upon which the spring eyes are bushed. The fixed blocks have closed forward ends and open at the rear for the purpose of assembly, or renewal of the sliding blocks. When the wagon is at rest, the sliding blocks shut against the closed front ends of the fixed blocks, these latter being sufficiently long for the sliding blocks to move backwards at the rebound of the springs after passing over an obstacle. The final transmission being by side chains, provision has of course to be made for taking up chain wear by pushing the axle backwards with the aid of adjustable radius rods; careless drivers might go on doing this indefinitely until the sliding boxes were pushed out of their guide ways. The precaution is therefore taken of fixed safety nuts on the adjusting rods, that will allow them to be rotated little more than the length of one chain link; when that point of wear is reached the chains must be shortened by taking out the redundant link or else allowing the chains to sag and possibly jump the front driving sprockets. The sliding boxes of these rear springs are lubricated by screw down greasers.

Wheels

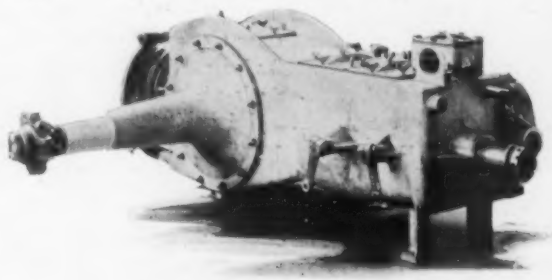
The wheels in all models are 34 inches diameter front and rear, excepting the 5 ton truck, which has 40 inch rear wheels. Wooden spokes and felloes are the standard for the 2 ton wagons, beyond that load capacity cast steel wheels are fitted. Both front and rear wheels have 12 spokes. Following are cross-sections of the solid tires recommended for specified weight, twins being regular on all rear wheels: 1 ton, 3½ in. front, 3 in. rear; 1½ tons, 3½ in. front, 4 in. rear; 2 tons, 4 in. front, 4 in. rear; 3 tons, 4½ in. front, 5 in. rear; 4 and 5 tons, 5 in. front, 5 in. rear.

Axles

The front axle is built up of two "I" sections riveted together and dropped 3 inches below the wheel hub centres to afford ample clearance beneath the engine when the springs are acting. The spring saddle platforms are inserted between the two sections of the axle and are forged up integral with the vertical centres of the steering heads. The rear axle is a circular solid steel forging, 3 inches in diameter, with spring supporting platforms clipped thereto by accurately fitting two-piece blocks. This form of rear axle is heavy in comparison with the total weight of the chassis, but this is a fault on the right side and the makers have yet to hear of one broken in service. The rear axles on 4 and 5 ton models are steel beams with inserted ends for the wheels.

Engine

Four sizes of engine are constructed: 2 cylinder 15 h. p. 100 m. m. bore by 120 m. m. stroke; 4 cylinder, 30 h. p., 100 m. m., 3.97 in. bore by 120 m. m., 4.71 in. stroke; 2 cylinder, 18 h. p., 120 m. m., 4.71 in. bore by 120 m. m. stroke; 4 cylinders, 38 h. p., 120 m. m. bore by 120 m. m. stroke. It will be noticed that all four engines have the same stroke and that the bore of each 2 cylinder model corresponds with the bore of approximately double power in the 4 cylinder models. One



Lacre Change Gear and Jack Shaft

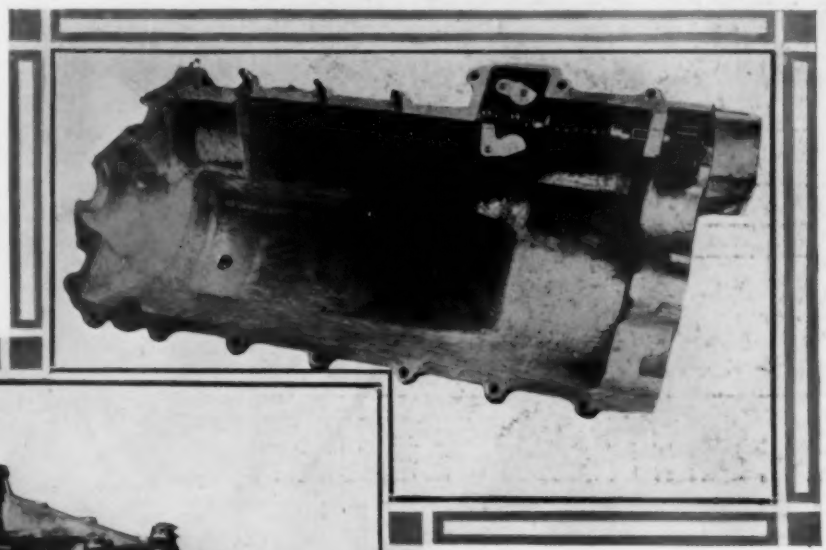
The case is substantially built and well supported.

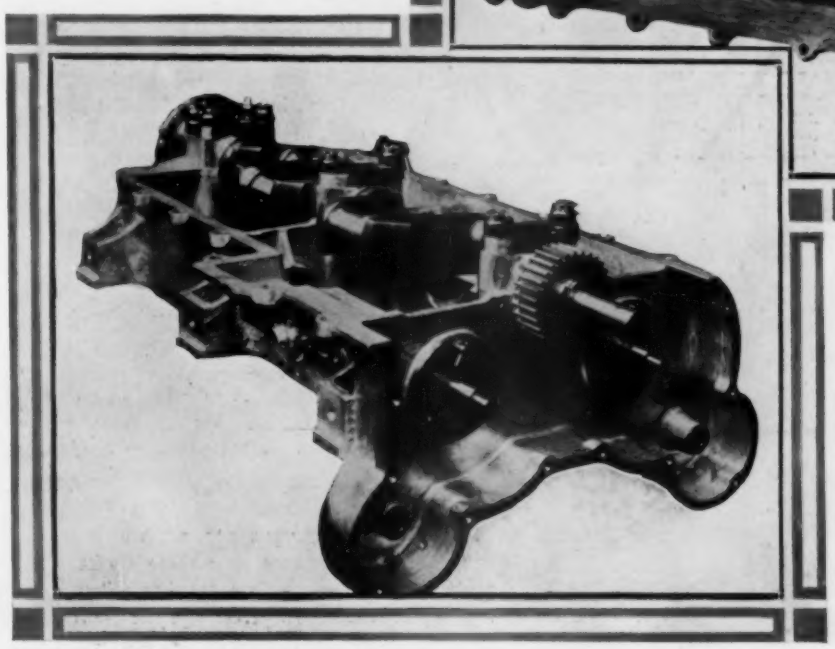
size connecting rod and two sizes of pistons only are wanted for all the models. Cylinders are cast in pairs with valves on opposite sides "T" fashion, inlet and exhaust valve interchangeable. Heads of valve tappet rods are adjustable and below the adjusters are brass caps, deep enough to surround the tappet rod guide; these casings are not made a dead fit, but are sufficiently close to prevent oil being ejected past the tappet rods. Tappet guides are bushed in hard phosphor

bronze, each pair held down by a single dog and central stud. Dogs and studs also retain the interchangeable valve caps in position, spark plugs being carried above the inlets whilst kerosene injection taps are fitted above the exhaust valve caps. The crank shaft rotates in three plain bearings lined with white metal, as are also the big end bearings of the connecting rods. The 2 cylinder engines have the crankshaft throws set at 180 degrees. The cam shafts are driven from spur gear wheels enclosed at the front end of the crank chamber, are machined integral with cams, and lift the tappet rods through interposed rocker arms acting against hardened rollers.

Oiling System

Lubrication is maintained by means of a centrifugal oil pump, running in a sump below the crank chamber, the pump driven off the same shaft that runs the water pump. Oil is forced under pressure to the crank shaft bearings only, the big ends and cylinder walls being fed from splash; the oil drains back to the sump through a filter when the quantity in the crank chamber reaches above a fixed level and thus avoids smoking. A by-pass pipe is led from the pump to the dashboard, where the oil pressure lifts a vertical plunger and so long as this keeps moving, the driver knows that the oil supply is right. Replenishment is effected by a combined funnel mouth and filter on top of the crank case, this also acting as an air release vent; beside the oil filler is a handle that has simply to be pulled up to open an outlet from the crankcase, visible through a gap of the undershield, and as soon as oil flows here, the driver is warned that enough has been poured in. A push down motion closes the try-level.





Two Views of Lacre Crank Case

At the left is a reverse view of the upper half of the case with part of half-time gear case removed. At the right is shown the throttle governor inside the case. This holds the engine speed down to 100 r. p. m.

Exceedingly large water jackets are cast round the cylinders and valve chests, inlet pipe from the gear driven water pump being divided into a couple of branches that enter between the inlet valves, the water then being directed around the exhaust valve chests before passing around the cylinders. The central outlet pipe is formed in one piece with the brass cap covering the cylinder jacket spaces and held down by studs screwed into the combustion head. The outlet pipe, a few inches from the cylinders, has a rubber union joining to another pipe, which instead of being attached directly to the small header tank of the radiator, has a screw collar with union nuts, rendering it possible at any time to remove the radiator without disturbing the rubber unions at inlet and outlet. The flat surface of the radiator gilled tubing measures 20 inches by 14 inches and is composed of 16 rows of tubes, each 4 deep; cooling is helped by a good diameter 4-bladed aluminum fan. The driving and driven pulleys for the fan are machined "V" shaped at an angle of 28 degrees, the driving medium being a length of ordinary common rope. This lasts as long as leather, does not slip and can be renewed for a few cents without any respect to getting the right size. Draw off taps are fitted to each cylinder jacket, the radiator, the water pump, and at the centre of the pipe between radiator and pump, the latter pipe being purposely carried down so as to become the lowest point in the water circulating system.

The gasoline tank, 8 gallons capacity, is carried on the driver's side of the steel dash and supplies the fuel by gravity via a very large dirt and water filter placed within easy reach of the driver so that it can be drained at any moment. The carburetor is a single jet type receiving all air through peculiarly shaped ports cut in a rotating drum, every engine being separately tuned-up and the air ports filed away by trial and error method. The air drum is inter-connected to the throttle drum lever and as there is no automatic air valve,

the designers aim to keep a fairly constant mixture within the limited range of engine speed. The only control lever is that for the throttle, and although the engine will run slowly, its rated power is given at 900 r. p. m., the maximum allowed being 1,000 r. p. m. In the early days of motor engineering, governors were practically universal and, whilst at first arranged to throttle the exhaust and then to vary the lift of

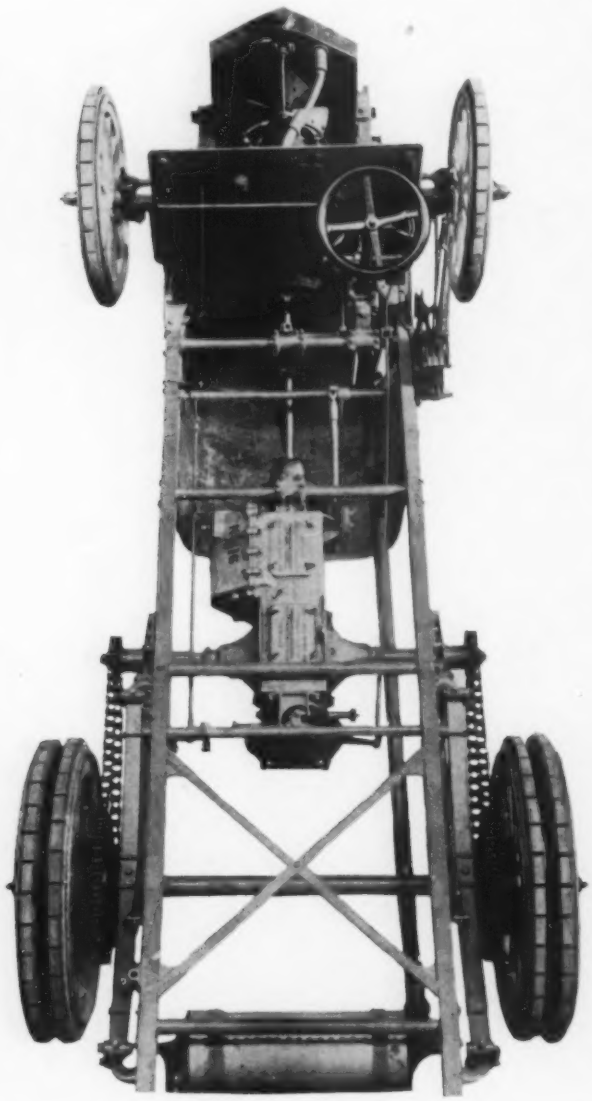


Photo of Lacre Chassis

All cross frame members are tubular, including the change gear case support. Frame well braced at the rear.

the exhaust valves, these at a later period were arranged at the gas inlet. It seems like a reversion to very ancient practice to provide throttle governor, yet the fitting of such upon Lacre wagons has been quite justified by results. The driver cannot exceed 18 miles per hour anywhere unless the clutch is depressed and the machine allowed to run free down a steep hill. The beauty of the device lies in the fact that the governor is inside the crank chamber, acting upon the inlet gas throttle drum by means of a short projecting shaft that carries a flat rod directly attached to the throttle drum shaft.

Novel Compression Relief

A Bosch high tension magneto is the standard ignition supply and, as the firing moment is fixed, a half compression system is fitted for easy starting of the engine. This consists of a handle conveniently close to the starting handle, which, when pulled forward, draws inclined planes beneath the exhaust valve stems and prevents them from completely closing. When supplementary ignition is desired, the manufacturers instal a second magneto with its own wires and spark plugs and will not fit an induction coil except under pressing circumstances. An earthing switch it attached to the dashboard.

Transmission

Transmission is through an 18 inch diameter leather faced cone clutch, propeller shaft with ball joint forward and double universal joint rearwards, 3 or 4 speed gear box mounted as a unit with the differential and final drive by side roller chains to twin tired wheels revolving on a solid axle. The gear box has 3 point suspension and is controlled from a side lever working in a gate. For the 3 speed gear box, highest direct drive and middle gear are obtained from dog clutches, lowest gear and reverse by sliding spur wheels; the two latter are shifted out of mesh when either of the higher gears are engaged. The pedal brake is metal to metal, locomotive type, attached behind the differential and with a direct pull from the pedal. The large diameter internal expansion rear hub brakes are functioned from a pull-back side lever. The method for adjusting the chains by the aid of radius and distance rods for each wheel can be better gleaned from the chassis elevation.

INCREASE IN MOTOR TRAFFIC IN LONDON. SOME SURPRISING FIGURES.

The change from horse to motor traction in London does not follow the old adage of "Slow but sure," but the new one of the motor truck of "Swift and sure." These statistics are from Gas Power Age, from those gathered by Mr. H. Hewitt Griffin, M. J. I., compiled annually for Motor Traction. In 1905 these figures show that about 1600 horse 'buses crossed Putney bridge during twelve hours on the average summer Sunday. At that time only five years ago, not a single motor 'bus was counted. At the present time these statistics are almost reversed, there being less than 100 horse 'buses and over a thousand motor 'buses. In percentage the figures are:

1905 Horse 'buses 100 per cent.
Motor 'buses none.
1910 Horse 'buses 7½ per cent.
Motor 'buses 92½ per cent.

The total number of people carried at the present is about the same, although the number of vehicles is less, there being about 36,000 people accommodated, 34,000 of which is by motor 'buses and only 2000 by the horse 'buses.

When we come to consider the lighter forms of traffic—such as cabs, carriages, dog carts, etc.—the change is seen to be only a little less striking. In 1905 the total traffic of the day in this class was 1076, of which 715—or nearly two-thirds of the whole—were horse-drawn vehicles. In five years there has been a marked increase in volume, showing that the motor

car—and especially the motor cab—has not only replaced an older form of traffic, but has created a new traffic of its own. The total number has risen to 1667—an increase of over 10 per cent. per annum—and of these mechanical traction is responsible for no less than 1423, or about 85 per cent. of the whole, while the horse traffic has in five years dropped to about one-third of its previous bulk.

Finally we come to the most comprehensive, and at the same time, the most astonishing figures of all.

Of all the wheeled traffic—excluding cycles—across Putney bridge on a fine Sunday in summer, no less than 88.64 per cent. is mechanically propelled, as against 16.04 per cent. in 1905. Similarly, the horse drawn traffic has dropped in the same period from 83.96 per cent. of the whole to the paltry figure of 11.36 per cent.

If we include cycles, the horse is only responsible for some five road vehicles in every hundred. Surely a very near approach to the "horseless age," and this not at a point selected for its peculiar conditions, but on a typical and much used thoroughfare from the west of London.

These figures are for pleasure traffic. Take figures, then, for a business day in Fleet street, which has been spoken of as "The Hub of the Universe." The first census unfortunately was not taken until 1907, when the motor cab had already taken its place quite prominently. Considering omnibuses alone, there were in 1907, during twelve hours, 3236 of these vehicles, of which 2241 were horse drawn. By the latest census the total number of vehicles has decreased to 2606, of which only 343 were horse drawn, the passenger carrying capacity having increased, owing to the increased seating capacity of the motor 'buses, from 92,000 to 97,500, or expressed in percentages:

1907 Horse 'buses 69.3 per cent.
Motor 'buses 30.7 per cent.
1910 Horse 'buses 11.6 per cent.
Motor 'buses 80.4 per cent.

Fleet street is not a place that would be frequented by 'buses unless they had business in that vicinity, as fast moving vehicles usually avoid Fleet street in traveling between the West End and the city, by going by the embankment or Queen Victoria street. If it were not for this, figures for cabs would show a much more marked increase than they do.

The cabs in 1907 were 1950 in number, only 48 being motor cabs, in 1910 a slightly smaller number are counted 1890, 1158 of which were motor propelled. Taking all classes of traffic into consideration and expressing the figures in percentage we find that whereas only three years ago 74 per cent. of the traffic in Fleet street was horse-drawn, it has now decreased to 48 per cent., in other words 52 per cent. of all traffic is now by motor. These figures are taken direct from comprehensive tables compiled by skilled statisticians with the greatest possible care and accuracy and may be relied upon.

What has taken place in London may well be expected to follow in course of time in many of the large cities of the United States.

The Truck Situation In Great Britain

BY FRANK PALMER

When one traverses the streets of London or the large provincial cities and towns in England and Scotland, and watches the enormous amount of motor truck traffic, it hardly seems possible to realize that the wonderfully flourishing industry is only some six years old. Trucks of all sorts, kinds and conditions had of course been on the streets away back since 1897, but most all such vehicles had only a short life, if not a merry one. Badly designed, poorly constructed and shockingly driven, these motor lorries, vans, wagons and trucks caused the whole industry to be handicapped, and brought commercial wagons into so bad repute that business men very properly refused to purchase similar affairs or be worried by their exasperating troubles. It was, of course, the old story of fitting truck bodies on to pleasure chasses, equipping them with solid rubber tires and designating the outfit as a motor wagon. It was the advent of the motor omnibus in London, in the middle of 1905, which first opened the minds of British motor engineers to the necessity of designing and building chasses specially adapted for business purposes, and since then progress has been phenomenal.

Motor omnibuses, because of their bulk and constant use in every day life, seem to monopolize attention, yet they are practically confined to London and all told, there cannot be more than 1100 running at the time of writing. These are all owned by one concern, the London General Omnibus Company, who have gradually absorbed all competitors (the last rival with 150 'buses was bought out the end of February, 1911) and look like again holding the position of 20 years ago when they controlled the horsed omnibus traffic in the English metropolis. This concern has had an uphill fight since they suddenly decided to purchase mechanically propelled 'buses and rushed ahead to buy anything with an engine, so long as it satisfied the test of running for half a dozen miles.

One way or another, the L. G. O. C. must have dropped over $1,000,000 on the rash venture, and tired of experimenting at its own expense for manufacturers, has now established its own factory and is producing higly creditable machines that are as quiet as the finest pleasure cars. Their latest type has a four cylinder 24-28 h. p. engine, 4 speed gear box with chain drive for each gear, and final transmission by propeller shaft. The standard seating accommodation is 16 inside and 18 outside, the latter all facing forward.

Taxicabs Educate the Public

The taxicab is ubiquitous, for there is not a town of any importance that does not possess a good number of them and more than anything else, these motor vehicles have contributed towards educating the public and breaking down the previous prejudice against motors of any sort. It is impossible to supply any reliable figures concerning the total number used throughout the kingdom, but the official figures relating to London show that at the end of December, 1910, a few over 6000 were regularly licensed and additions are made daily. There must of course come a period when supply exceeds

demand, yet despite the opinion of those who are supposed to be able to judge, there does not appear to be a measurable limit to the taxi. Three years ago, experts reckoned that 4000 would about satisfy London's requirements, but 50 per cent. over that number are earning good money and the more that come upon the streets, the greater does their employment grow.

Cause of Success

The cause of this extraordinary success is due to many factors of which the most prominent is the reasonable fare fixed by the police, who control the issue of licenses for the vehicles and the drivers. For two persons the rates are 16 cents for the first mile, and 4 cents for each succeeding quarter mile, one or two extra passengers being charged 12 cents each for any distance. The earnings are divided on a sharing basis, the drivers taking 25 per cent. and paying for all gasoline, whilst the owners take 75 per cent. Every cab is carefully tested by special inspectors before licensing and must conform to a standard schedule, in respect to quietness of engine and transmission, power to easily surmount steep hills with a full load, facility of turning inside a 25-foot circle, be smartly painted, upholstered in accordance with official specification, and be properly sprung. Every 12 months each cab must undergo fresh inspection and be repainted, and this last regulation results in Londoners having the use of the best fleet of taxicabs of any city in the world. The largest owner is the General Motor Cab Company, Ltd., with about 2600, next comes W. & G. Du Cros, Ltd., with some 1500 and the F. I. A. T. with about 600, the balance being made up by several smaller companies. A few drivers own their cabs, but these probably do not amount to more than 200. The average earnings per day per cab are about $7, and when all the outgoings for pneumatic tires, repairs and establishment expenses are reckoned, it can be well understood that the companies must keep close watch upon every item of expenditure to earn dividends for share owners.

Heavy Steam Trucks in London

The steam wagon, carrying 5 tons or over, supplies the needs of breweries, millers and the like, where speed is not the main consideration, or where exceedingly long distances have not to be traversed. Municipalities and town authorities, up to three years ago, greatly favored heavy steamers for collecting house refuse and for street watering, but the awful noise created by the steel tired wheels has prevented further usage in this direction. For a short period, this type of machine was under a cloud, so far as concerns work in cities, until some bold person equipped one with solid rubber tires; not only is noise thereby eliminated, but the legal limit of speed is raised from 5 to 12 miles per hour and the undoubted economy that steam can effect over gasoline, when there is a regular big haul, day after day, is bringing the heavy steamer back again into favor. For loads up to two tons the steam has no chance against gasoline, there being only 6 light goods delivery steamers in the whole of London, and the writer is unaware of any others elsewhere.

Gasoline wagons naturally divide themselves into a couple of classes—weight carriers up to 2 tons and over that weight up to about 6 tons. Dealing with the heavier class first, the enormous increase in their development even surprises the most cheery optimist, for it was always reckoned that for big loads, steam was more economical. So it is, if there is a straight away non-stop run of at least 10 miles and an absence of delay in getting rid of the load or taking on a fresh one. The official registration figures do not differentiate between heavy and light wagons, yet a conservative estimate would place the former somewhere near 5500 for the whole kingdom.

Motor Fire Apparatus

The most striking outlet for manufacturers' energies, relating to heavy gasoline types, concerns fire engines. The superintendents of fire brigades held on to horses against all the possible arguments and facts that could be adduced in favor of mechanical propulsion and when their hands were forced by stress of circumstances, these men were so much in love with steam that they went out of their way to purchase crude designs in no way suitable for quickly reaching the scene of a fire. However, wiser counsels have prevailed, and gasoline rules the field. The London County Council, who ought to have led reform at the commencement, held up progress in the manner indicated above and but for the fact of a new superintendent coming on the scene, the largest city in the world might still be saddled with antiquated horse drawn fire engines. The cost would be too great to at once throw out the old machines and instal motor fire engines in every station, still a change is slowly but surely being made, as opportunity offers for disposing of the old types to small towns. The design of the latest models comprises a 4 or 6 cylinder engine of 50 h. p. with a four speed gear box and final transmission by side chains to twin solid tired wheels. The motor engine has brought with it a complete revolution of idea for water pumping apparatus, the turbine type entirely displacing reciprocating pumps.

Trucks of Two Tons Capacity Predominate

The 2 ton wagon of course stands foremost as regards numbers, and it would indeed be difficult to find any trade that is without at least a few of these vehicles. The large universal supply stores now entirely rely upon them for town and suburban delivery, and has so extended the area of supply that they are found every day at points 30 miles from the center of London. To show how trade in these machines has increased, it can be noted that one factory which started its career with pleasure cars has practically dropped the latter from its program and now devotes nearly every corner to the light wagon with a 2 cylinder 16 h. p. engine, automatic ignition and carburetion, 4 speed gear box and side chain drive to solid tired wheels. Business houses owning 100 are quite common, whilst newspapers find them indispensable, one London journal running 25, with all the other papers in proportion.

Commercial Motor Cars Ten Per Cent of Traffic

Statistics are sometimes misleading, yet there is no getting away from a recent official count of traffic passing certain points in London which tells that motor wagons now constitute 10 per cent. of all traffic. (Taking motor traffic of all kinds, it constitutes now more than 52 per cent. of all sorts of traffic in central London.)

Alden Sampson Half-Ton Truck

BY LEN G. SHAW

FOR some years the Alden Sampson Manufacturing Company has been making trucks and road trains in its plant at Pittsfield, Mass. Now this concern, which is the truck division of the United States Motor Company, has removed to Detroit, where an immense plant has been built, and where road trains, five, four, three, two, and one and half-ton trucks will be produced.

While the entire Alden Sampson line commands attention, the half-ton truck is perhaps the most interesting at this time, inasmuch as it is an entirely new product, with numerous features that are worthy of consideration.

It is a machine built strictly for commercial work and is in no sense a remodeled or modified touring car, although it is of but 1,000 lbs. capacity, less than many a touring car carries. The frame, axles and parts are much heavier than those of even the largest touring cars. Briefly stated, this truck, rated at 1,000 pounds, although it has an actual capacity of 1,500 to 1,700 pounds, has a two cylinder opposed 18 h. p. motor, selective sliding gear transmission, with shaft drive to a full floating rear axle, with special double gear reduction and has a 94 inch wheel base. The entire mechanism is compact, and it is evident that the truck was designed for service.

Alden Sampson Half-Ton Wagon

The Power Plant

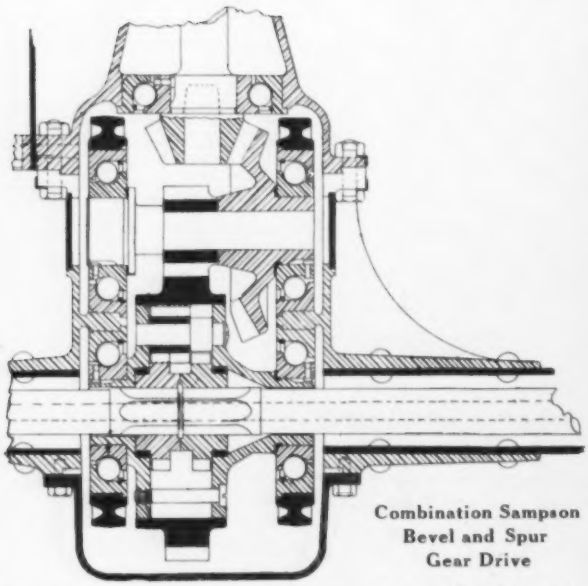
The two cylinder motor is of four cycle type, with a bore and stroke of 4¾ inches, and develops full 18 h. p. The cylinders are of L-type, with two inch valves, a thermo syphon system feeding the water jackets, which extend well below the explosion chamber.

The motor and change gears are mounted on a sub-frame of angle iron. The latter is supported at the point by extensions of the front cross frame member, which rests directly on the main frame side members. At the rear the side pieces of the sub-frame are hung by the lower ends of a wish bone shaped piece, swung from a stud at a single point at the top. This gives the sub-frame a three point suspension.

Drop forged 40 point carbon steel is used for the crank shaft, which is two inches in diameter on the main bearings, 1⅞ inches in diameter on the wrists, and has 1¼ inch webs. The main bearings are of die cast nickel babbitt, and are two inches in diameter by five inches in length. Forty point carbon steel is also used for the drop forged connecting rods, which are I-beam section, with the connecting rod cap held in place by two bolts, adjustment being obtained by means of shims. The main connecting rod bearing is of the die cast nickel babbitt, 1⅞ x 2¼ inches in size, with each half cast separately. The upper end of the connecting rod contains the piston pin bearing, the pin for which is 1¼ inches in diameter by 2⅜ inches long, and is locked to the piston by means of two set screws. The piston is of the flat head type, and is fitted with four rings, three of which are above the wrist pin and one below.

The cam shaft is a one-piece drop forging of carbon steel, one inch in diameter, hardened and ground, with the cams integral, the timing gears being enclosed in the front end of the motor.

Cooling is thermo syphon, with a vertical tube type radiator of efficient design. This consists of two rows of flat tubes and horizontal fins, and has a capacity of 4½ gallons. The water connections are one inch in diameter, with separate



Combination Sampson Bevel and Spur Gear Drive

inlet and outlet to the radiator from each cylinder, this insuring free circulation at all times. The services of a fan are dispensed with.

Lubrication is obtained by means of a force feed lubricator of plunger type in conjunction with a splash system, the lubricator having a two-quart capacity, being driven by a circular section leather belt from a pulley on the magneto shaft.

Ignition is by means of a low tension magneto and fixed spark, the magneto being located on top of the crank case and driven through a clutch at engine speed.

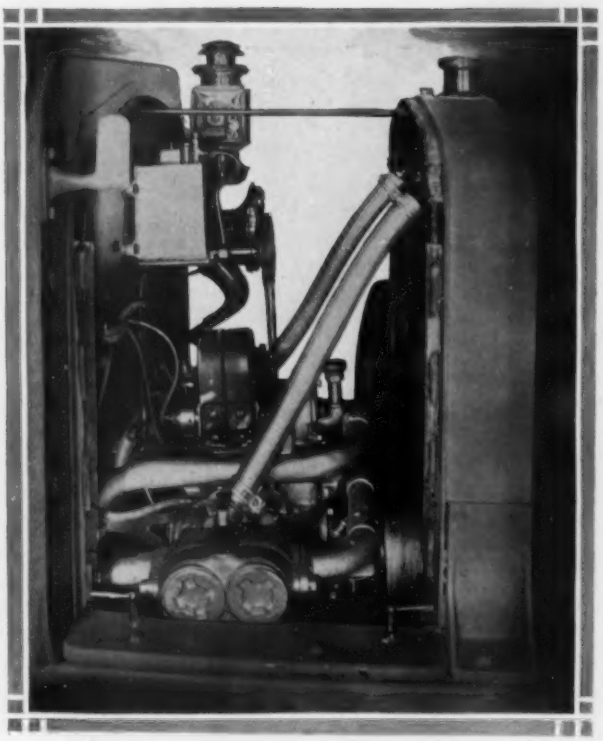
A one inch float feed carburetor of conventional type takes its supply from a rectangular gasoline tank located under

Alden Sampson With Screen Body

the driver's seat. This tank is made from 22 gauge terne plate, with all seams heavily reinforced, and has a capacity of fifteen gallons.

The Dry Plate Clutch

Fitted to the 16 inch fly wheel, which has a four inch face and weighs approximately 100 pounds, is the multiple disc, dry plate type clutch. This consists of three steel discs 10 inches in diameter, which are carried on pins in the fly wheel, and two steel discs slightly large in diameter, carried on pins in a sleeve rotating on the extension to the crank shaft. To each of these rings a raybestos ring one inch wide is

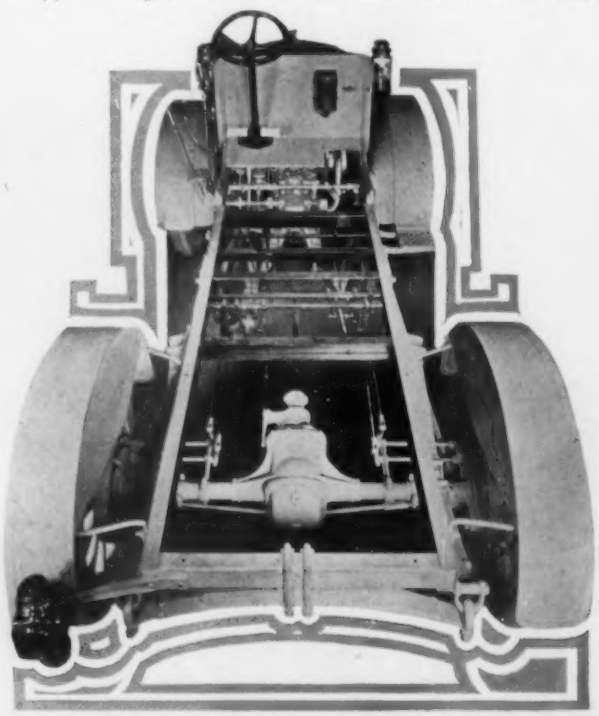


Motor In Position In Sampson Truck

riveted. The clutch is actuated by a 270 pound coil spring concentric with the crank shaft extension and backed by ball thrust bearings, giving very easy but effective action.

Compactness a Feature

Compactness is the distinguishing feature of the three speed selective sliding gear transmission, which is of vertical type. All gears are of chrome nickel steel, and are six

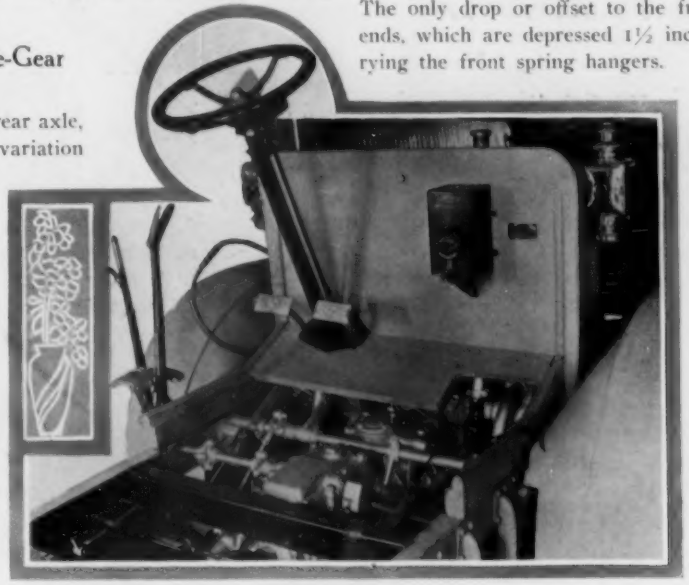


pitch, with one inch face. Roller bearings are used throughout, and the shifting bar is connected to the selective hand lever by means of a very simple and effective double universal joint which makes the operation of the lever very easy at all times. Access to the transmission gears is gained through removing the entire top of the case, making inspection a simple matter. The main shaft is above the secondary shaft. The transmission case is supported on four integral arms resting on the sub-frame.

Connection between the clutch and transmission is effected by means of a housed double pin and block universal joint, and final drive to the live rear axle of floating type is through a one inch propeller shaft of forty point carbon steel, having two universal joints.

Rear Axle with Double-Gear Reduction

Novelty resides in the rear axle, which presents a marked variation from the construction ordinarily found in live axles, owing to the introduction of a double gear reduction. To keep the speed of the car at normal and make possible the use of a moderate sized motor a reduction of six to one is used. This is obtained through a bevel gear reduction of approximately two to one, a bevel pinion on a short propeller shaft meshing with a bevel gear carried on a short shaft parallel to the propeller shaft, both pinion and gear being carried on annular ball bearings. This same shaft carries a spur gear of six pitch and 1¼ inch face which drives the spur gear on the differential housing, giving an additional reduction of three to one, this arrangement and the operation thereof being clearly shown in the accompanying diagram. The differential is of the spur gear type, and is mounted on large annular ball bearings, Timken bearings being used for the wheels.



Rear of Dash, Showing Controls

Two Sets of Brakes

The truck is fitted with two sets of brakes—internal service 12x2 inches, and external emergency 12⅜x2¼ inches, both equipped with copper asbestos lining—giving ample control. The brakes are protected by a snugly fitting splash plate. Brake torque is taken care of by means of an eight gauge pressed steel torsion bar that operates independently of the radius rods, the front end of this bar being carried in a conventional type, double spring suspension and the rear being bolted rigidly to the rear axle. The brakes are operated by straight pull rods all inside the panel line and fitted with eveners.

The front axle is a drop forging, rectangular in form, and has a three inch drop at the center. Extra heavy cone type ball bearings are used in the wheels, and the axle spindles are 1⅝ inches. This axle is unusually husky for a small capacity car.

A worm and gear type steering gear is utilized, it requiring approximately a full turn of the 17 inch steering wheel to throw the wheels from one extreme to the other. Throttle control is located to the right of the steering post and beneath the wheel.

The Frame

With a view to providing for the inevitable overloading, the frame of this truck has been made sufficiently strong to sustain any strain to which it may be subjected. It is of channel section 3-16 inch pressed steel, 3½ inches deep, with two inch flanges, and having 6 heavy channel steel cross-members and gusset plates at each corner to insure rigidity. The only drop or offset to the frame comes at the forward ends, which are depressed 1½ inches to form the horns carrying the front spring hangers.

The front springs are semi-elliptic, 38 inches long and 2¼ wide. The rear springs are of platform type, the cross spring, 39 inches long by 2¼ inches wide, being supported by steel castings riveted to the frame. The side springs are 40 inches long and 2¼ inches wide.

Wheel base is 94 inches and tread standard. Tire equipment is optional, either 32x4, pneumatic or solid. The chassis weighs complete about 2,000 pounds. With body and equipment it runs from 2,300 to 2,600 pounds, according to the style of body furnished. Four standard types are provided—open express, flare board express, screen panel or full panel. Special bodies will also be furnished if desired.

The Sampson half-ton truck ranges in price from $1,150 to $1,350, depending upon the body.

Atlanta, Georgia, is asking for bids for an ambulance for the Grady Hospital. Alderman Strapling is chairman of the committee.

General Superintendent W. J. Tyler, of the Frisco Railroad, is purchasing motor trucks to operate between Rogers, Bentonville, Arkansas, and Grove, Okla., as feeders to the railroad.

Six Chase motor trucks, purchased during the automobile show at Wilkes-Barre, Pa., were recently delivered to the purchasers who are Davis Bros., W. A. King & Co., Keiper's Confectionery Store and the Dougherty Soda Factory.

The value of the motor truck in field transportation has been strongly urged recently by Captain J. C. MacArthur, of the Twenty-eighth Infantry. He maintains that an auto-train will carry the same amount as a mule train six times as far and much more rapidly, and advocates that the government buy its auto-trucks outright and offset the expenditure by selling its mules.

The Commer Truck

BY D. E. SCRIBER

WYCKOFF, CHURCH & PARTRIDGE, New York office, 1743 Broadway, after inspecting all the trucks of Europe, with a view to selecting a machine to build on this side of the water, finally decided on the Commer Car, a well-known truck from Luton, Bedford, England. These vehicles are being built in a factory at Kingston, N. Y. There will be 3, 4, 5 and 7 ton machines in the regular output.

The Commer truck literally bristles with new and noteworthy constructions. Briefly some of these are as follows: A transmission which is foolproof and gives to a certain extent an automatic change of speeds some time after the gear shift lever has been moved, if this is desired. Special torque rods are attached to the rear axles; all members are three point suspended. There is a buffer drive device which eliminates shocks on the change gears, chains, etc. A special lubrication system is employed, and throughout the entire car accessibility has been provided for.

It is stated that the Commer Truck is the result of over seven years' experience, $200,000 being spent in experimental work alone prior to placing anything on the market. It might also be said that another of the chief features which the engineers who designed this truck had in mind, was to produce a machine which, besides being reliable and efficient, would actually stand up under the treatment to which trucks are invariably subjected, either by poor drivers or bad roads, lack of mechanical attention and excessive vibration. The attempt was made to have the mechanism as fool-proof as possible with what results can be judged from a reading of the details of the construction.

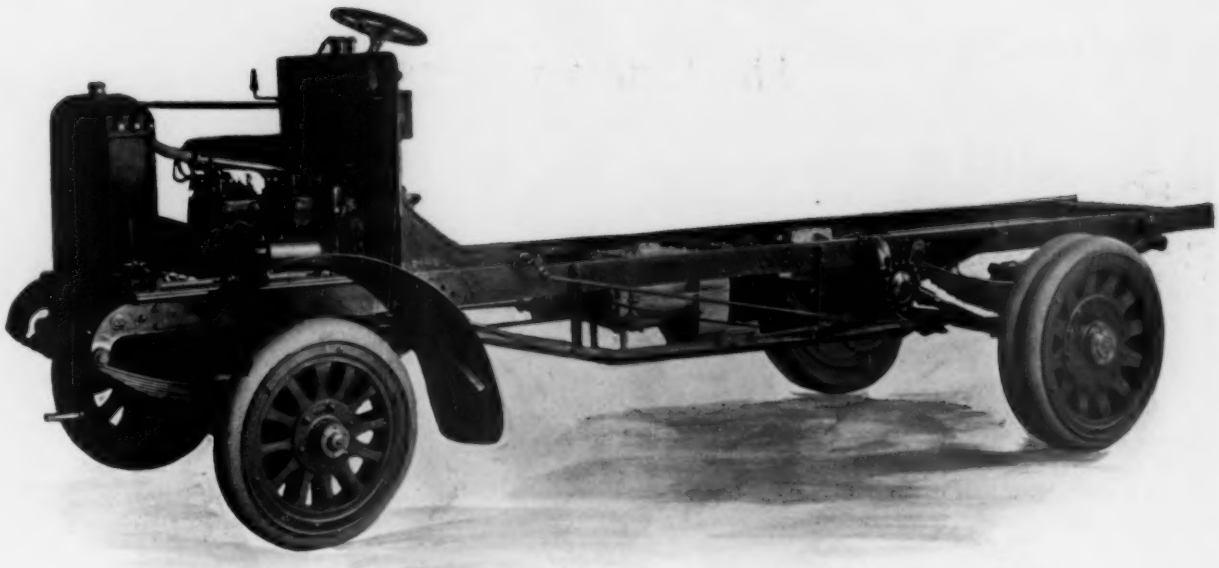
An Unusual Change Gear

A most unsatisfactory feature of most trucks, and one which causes considerable expense, is the gear box. The Commer designers departed entirely from standard practice producing a gear which is certainly fool-proof. Briefly, the gears are always in mesh and dog clutches actuated by spring controlled levers affect the changes in speeds.

The driver's effort in shifting the change speed lever from one notch to another in reality only compresses springs, and does not itself shift any gears or even the lug clutches, thus allowing the driver no chance through carelessness or otherwise to damage the change speed mechanism. It is also impossible for him, even though inexperienced, to miss a gear shift as sometimes happens on a hill. After the lever has been set for a certain speed the gears are automatically shifted by the springs before mentioned, by simply disengaging the clutch and slightly throttling down the engine. This action is accomplished as follows: moving the gear shift lever compresses a set of springs which control the arms which move the dog clutches. These clutches are undercut, so that as long as the engine is driving the load, the spring will have no effect, but just as soon as the engine speed is momentarily reduced there is a tendency for the vehicle to drive the engine, which instantly frees the dog clutch, which under the action of the compressed springs, already set by the movement of the gear shift lever, forces the clutch to take up its new position, engaging the desired speed. This means that slightly throttling the engine and releasing the clutch will

Commer Truck Fitted with Special Body

Fig. 1. The Comme Truck is now being built in America at Kingston, N. Y., by Wyckoff, Church & Partridge. It has many new and interesting features, such as a special transmission giving four speeds ahead and a reverse, with practically automatic gear shift by means of dog clutches, a rubber buffer drive, etc.



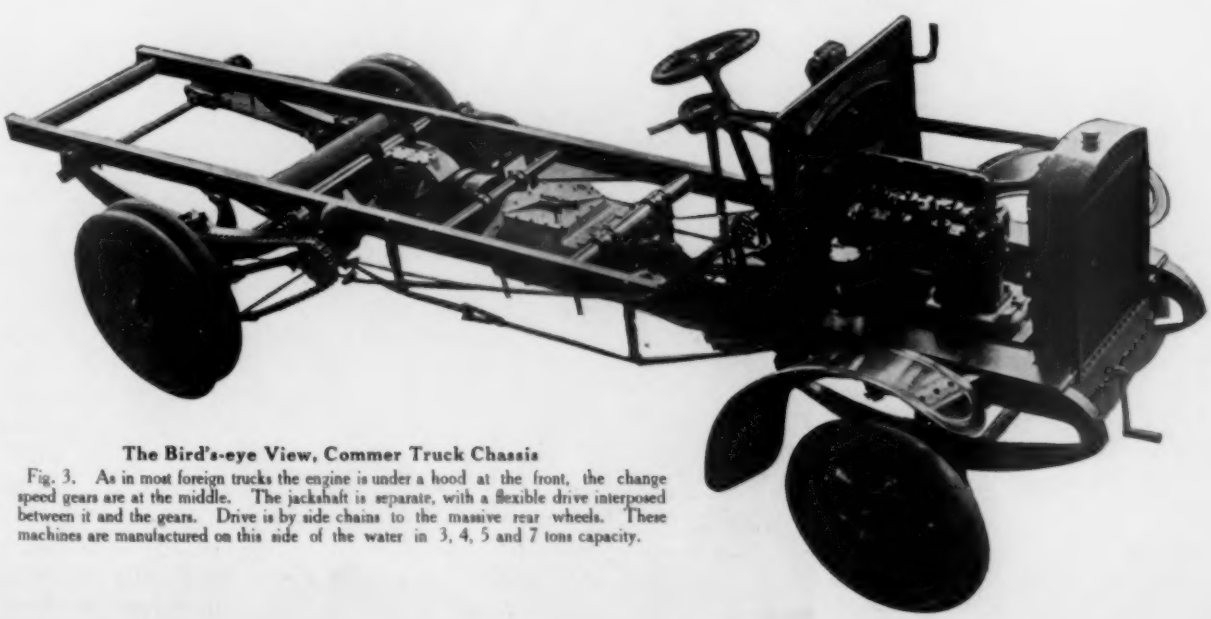
Chassis of Commer Truck

Fig. 2. This machine has a four-cylinder engine 4½ by 5½, unusually heavy-built wheels fitted with twin solid tires at the rear. A novel arrangement consists in placing the gear shift lever under the steering wheel, this being a very practical and convenient location. Motor, change speed gear, and jackshaft are each mounted on a three-point suspension; all parts are unusually accessible.

always effect the desired change of gears, but this may not take place until any desired moment after the gear shift lever has been moved. By this arrangement it is possible for the driver to approach a hill and before reaching it, if he thinks it too steep for the highest speed, he can set the lever for the next speed. The gears will not shift as long as the engine is driving until at the desired moment on the hill, by releasing the clutch the change will automatically be effected with certainty and precision. There are four speeds forward and one reverse.

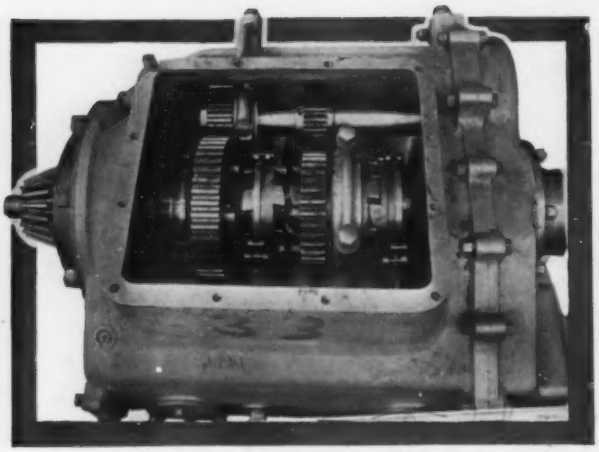
The gear shift lever in this truck is in an accessible place directly under the steering wheel, so that a slight twist of the wrist is all that is required to shift it. The lever is very short and therefore the arc of motion small. To the writer this appeals as being almost an ideal condition.

The company states that as a test of this change speed mechanism twelve gear boxes were sealed by experts, and after between 26,000 and 52,000 miles had been run the seals were broken solely for the purpose of renewing the bushings. The broad statement is made that they have never renewed a gear or dog due to damage by wear in any instance up to date, and that the makers themselves are unable to estimate the probable life of these change speed gears.



The Bird's-eye View, Commer Truck Chassis

Fig. 3. As in most foreign trucks the engine is under a hood at the front, the change speed gears are at the middle. The jackshaft is separate, with a flexible drive interposed between it and the gears. Drive is by side chains to the massive rear wheels. These machines are manufactured on this side of the water in 3, 4, 5 and 7 tons capacity.

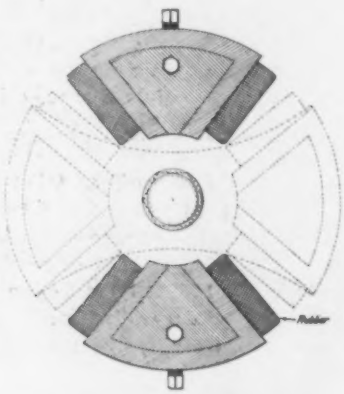


Commer Four Speed Change Gear

Fig. 4. This change gear case is unique in the method of operation, the gears are continually in mesh, individual dog clutches giving the various speeds. These clutches, however, are not moved directly by the gear shift lever but by springs which the gear shift lever compresses, the actual movement of the dog not necessarily taking place when the gear shift lever is moved but always occurring when the clutch is released.

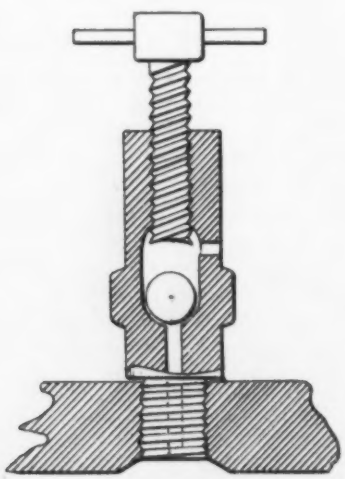
The Motor

The Commer engine is of the four cylinder type, cylinders cast in pairs with the one piece nickel steel valves on opposite sides. The bore is 4½ and the stroke 5½, rated as 36 h. p. at 900 r. p. m. It is claimed the machines can be throttled on the high when fully loaded to a speed slower than a walk. The engine is three point suspended at the front under a hood. At the forward end the motor is supported by a hanger which surrounds an extension of the front annular ball bearing of the crankshaft. At the rear end the case is supported by being bolted to a channel section steel casting, the ends of which are carried by the side frame members. The drop forged crankshaft is mounted in three annular ball bearings of F. & S. type, using ⅞ in. balls. Connecting rods are the usual H section drop forgings, caps held by two 9-16 in. diameter bolts and bushed with white metal. Castle nuts and cotter pins are used. The upper end of the connecting rod is bushed with a 15-16 in. diameter bronze sleeve bushing. The piston pin is of nickel steel, solid, and prevented from side slip by a taper pin which fastens through the boss and a slot cut into the end of the wrist pin. The pistons are long and slightly tapered above the pin. Four eccentric diagonally cut piston rings fit separate grooves at the top. The cylinder castings are held by six bolts to each pair, with lock washers under the nuts. The valves are on opposite sides, there being a brass screw plug over each. The caps over the inlet valves are each fitted with two spark plugs, so that both the battery and magneto plugs are in this advantageous position. Over the exhaust valve are special ball compression relief valves, a sectional view of one being herewith illustrated. These have the advantage, that when testing the engine while running, by releasing them, no air can be drawn into the cylinders to weaken and therefore change the sound of the explosion. Screwing down the small handles forces the ball against its seat, making an absolutely gas tight joint.



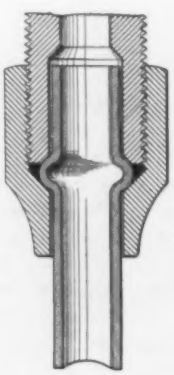
Commer Buffer Drive

Fig. 7. This buffer arrangement consists of two similar castings each fitted with heavy rubber bumpers and transmits the power from the change speed gears to the jackshaft. Engagement of the rubber blocks presents an ever-increasing surface, thus affording a gradual cushioned engagement relieving the gears and chains of all shock.



Ball Check Relief

Fig. 5. This ball check when screwed down makes an absolutely gas-tight joint. When relieved the sound of the explosion can be heard as it actually is, owing to the fact that the ball closes on the intake stroke preventing a dilution of the mixture.



Pipe Connection

Fig. 6. The ring forming the joint is produced from the pipe itself by swelling it by a special machine, no brazing or soldering is used. All pipes are one-half inch diameter fourteen gauge.

The entire engine may be removed after the front cross frame member and radiator have been taken out, a few bolts sufficing to release these members.

The Lubricating System

The oiling system may be termed a combination of pump, gravity feed and splash. The sub-base of the crankcase forms an oil reservoir. From this the oil is pumped by a worm driven gear pump, operated from the rear of the camshaft. It passes first through a cylindrical shaped strainer to a sight feed on the dash, from which it flows by gravity to a point at the center of the crankcase and passes through cored passages, there being four oil leads from this passage to four boat shaped hollows at the bottom of the case, into each of which scoops on the bottoms of the connecting rods dip. Splash lubrication therefore takes care of the various parts. At the sight feed there is a small overflow, so that when running at high speed a little oil is carried down to the Bosch

magneto screw gear drive. On the 3 and 4 ton trucks a pint of oil is said to be sufficient for 100 miles, and on the larger trucks increases up to perhaps a quart for 100 miles over average roads.

The accessibility of parts on the engine is very noticeable. Oil is put into the crankcase through a pipe with filler cap, this cap being labelled oil. The worm and worm wheel drive of the pump can readily be inspected by the removal of a plug on the right side of the engine. A novel arrangement allows the complete removal of the oil strainer from the bottom of the case without allowing the oil to run out. This is possible by means of using a small poppet valve which is spring pressed against its seat as soon as the wire screen is removed, thus preventing the oil from flowing out. The insertion of the wire screen lifts the valve from its seat again, allowing the oil to flow through the pump.

The Ignition

A double ignition system is employed, but differs slightly from that usually used. In a protected position at the rear of the engine, in an opening in the dash, the magneto is mounted on a bracket bolted to the rear of the case. It is held by a strap for quick removal, and in this position is protected from any rain which might be driven upon it by the fan, as happens when located forward. This magneto has two high tension distributors, one for itself with wires leading directly to one set of plugs over the inlets, and the other distributor takes care of current from a 60 ampere hour storage battery in a box on the side of the driver's seat. For the battery ignition, a single vibrating coil on the dash is used. The timer or circuit breaker is also contained in the magneto, thus absolutely synchronizing both ignition systems, and the advance and retard is by a single ratchet lever on the dash, again taking care of both systems at once. As the car is usually run on the magneto the spark lever is practically untouched, leaving the driver nothing but the throttle to handle. A switch on the dash gives magneto or battery, or both. There are detail refinements such as small brakes on the armature shaft to prevent the slight rattle sometimes noticeable when running slowly, due to the jerk of the armature past the pole pieces.

A four-bladed aluminum fan is mounted on a standard at the front, a heavy U shaped spring supporting the bearing.

A leather cone of large diameter forms the clutch, it is fitted in halves and easily renewable. The spring is self contained. The change speed mechanism gives four speeds ahead and a reverse, its special features having already been dealt with. This mechanism is also three point suspended as are all the principal assemblies in this truck.

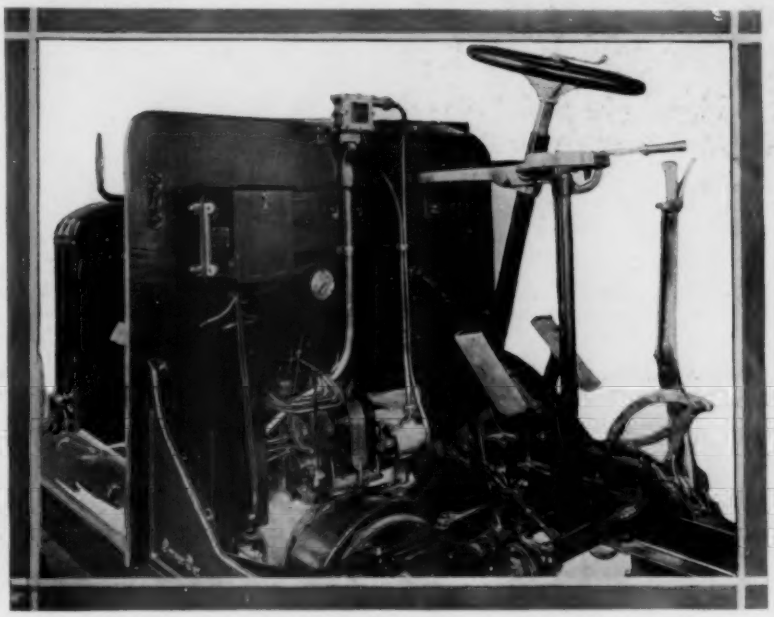


Fig. 8 Details of the Commer Dash Board

The Rubber Buffer Drive

Interposed between the change speed mechanism and the jack shaft is a rubber buffer which greatly relieves the shock on the gears and chains. With reference to the accompanying drawing, the construction is as follows: two lots of four pads of rubber are fitted to two castings of identically the same construction, the castings being fitted one to the back end of the gear box and the other to the front end of the bevel and differential box in such a way that the rubber faces of No. 1 casting are opposite and butting up against the faces of rubber of No. 2 casting. As these rubber pads are clipped radially on the castings, the lowest portion of the rubber pads come in contact with each other first. As the pressure on drive increases so does the lower portion squeeze up and more surface comes under pressure. When the full drive is on, the entire surfaces of the pads are in contact with each other.

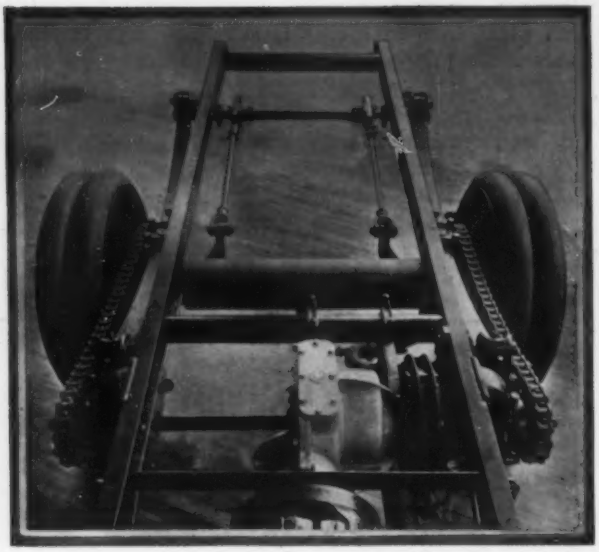
The advantage of rubber pads is that whereas a spring once thoroughly compressed is no more a spring, the rubber is always compressible to a further point, the pressure of course required to compress these rubbers being greater, as explained above, as the force applied increases. It should be clearly understood that the castings are fixed and in no way does the buffer drive act as a universal joint.

The jack shaft housing is three point supported, two points being of course by the outboard bearings to the side frame members.

The jack shafts proper float in the differential box, i. e., the end of the jack shaft is squared to fit into the large differential wheels, and are thus easily withdrawn. The other end of the jack shafts have their sprockets fitted to them on a 3 per cent. taper, keyed on by two keys and bolted by castellated nut and pin. The drive is by side chains.

Brakes

The foot brake operates on a drum of the differential shaft by means of a pedal on the foot board. The side hand brakes operate expanding shoes of large diameter and specially faced with hardened material against drums of the rear wheels. It is claimed these brakes are amply powerful to hold the truck fully loaded on the steepest gradient, and that the adjustment is so simple that no driver need complain.



Rear of Commer Chassis

Fig. 9. Attention is called to the brake anchor rods. Two of these are so arranged that the springs are relieved of any unnecessary strain which might be brought upon them by a tendency of the axle to twist, due to the brakes.

The Brake Anchor Rods

The torsion or radius arms at the rear of the chassis act as brake anchor rods, the idea being that when the brakes are applied or the engine is checked or accelerated, this strain would come on the rear springs through the axle, the tendency being if there were no additional rods for the back part of the chassis to rise perceptibly. By fitting these additional radius rods or brake anchor rods, this unnecessary work or strain which would come on to the springs is eliminated, thus allowing the springs to perform their correct functions independent of other work.

These back radius rods or brake anchor rods and the torque rod form practically a parallel motion.

To minimize any error on large size trucks the brake anchor rods are clamped in position with half load. They take up their own adjustment when the torque rod is lengthened for the purpose of tightening up chains. The best state for these brake anchor rods is to be in slight tension. This will be the case if the chains are adjusted under load as they should be.

The front springs are mounted on platforms thrown out on the front axle fork's casting for that purpose, and the springs are held in position by four spring clip bolts, with the spring clip plate on top.

The rear springs are mounted in practically a similar manner, only the casting is of different construction to take the torque rod fork. At the end of the springs are suitable shackle boxes which are held in position, one on the end of the spring and the other portion on the frame. Oiling device is fitted to the shackles for lubrication purposes.

The gasoline tank is of the gravity fed type, fixed under the driver's seat, fitted with a special screwed down needle valve to turn off the gasoline from the driver's seat. This, in the event of the breakage of the gasoline pipe or in case of fire, is a strong point. The inlet of the tank is fitted with a strainer. The gasoline pipe has no brazed-on collars. A ring, as shown in the accompanying sketch, which forms the joint, is forced up out of the pipe itself by a special machine, thereby avoiding the weakening of the pipe which always occurs when a liner is brazed on to it.

The exhaust pipe is fitted with a spring joint, and is not brazed. This allows for contraction and expansion.

The silencer is mounted on trunnions, enabling it, although rigid, to rotate or to swing when the exhaust pipe lengthens or shortens through contractions or expansions.

A point claimed for the "Commer" truck is the little power which is required to drive it, which enables the truck to coast on a small down grade, thereby saving gasoline and general all around wear.

Another point claimed is the high speeds at which the "Commer" truck can run without any excessive wear. This high speed is well warranted in view of the fact that extra work can be done resulting in reduction in running costs, the establishment charges being reduced per mile on account of the extra distance traveled.

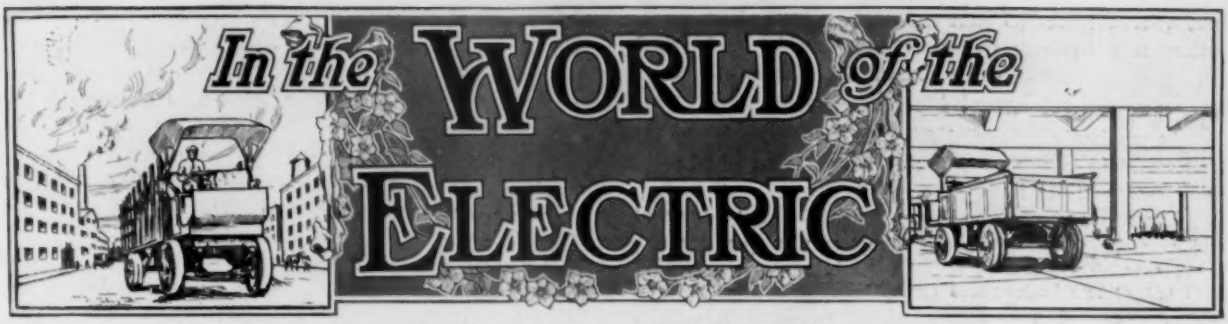
NEW YORK TO HAVE MOTOR STREET SWEEPERS

Another New York City department is about to follow the progressive lead of the Fire Department and install motor-driven vehicles. This is the Department of Street Cleaning, for whose benefit a series of tests of a motor-driven street cleaner has just been completed. Although no report has been made as yet it is understood that these tests were so satisfactory that some of these cleaners will soon be put to work sweeping the streets of the city.

COMMERCIAL VEHICLES MUST BE DEVELOPED FROM THE LOCOMOTIVE

"Auto trucks for heavy service are not to be developed from the pleasure vehicle, but from the locomotive," says R. B. Van Dyke, ass't mgr. of Sales Dept., of the American Locomotive Co. Motor trucks are essentially locomotives operated without the advantage of smooth rails. They must have not only pulling power for locomotion, but strength to withstand the punishment of rough roads. City streets are not by any means all smooth, and motor trucks, in order to justify their existence, must negotiate difficult places around freight houses and yards as well as on highways. Steam locomotives have been brought to their present state of development by over 80 years of constant, systematic effort. Those who are wise enough to design and manufacture trucks in the light of this experience, will avoid many mistakes and reach the desired results in trucks sooner than those who do not."

Toronto's city engineer has officially declared that motor 'buses would relieve the congestion of the streets. It is estimated that 200 cars would cost $1,000,000 and from $16 to $20 each per day to operate, figuring on service of 80 miles a day, and allowing for depreciation. About $500,000 more would be required for a plant to care for the vehicles, which would be of the single deck variety, heated and lighted, and furnishing accommodations for 30 passengers.



CONDUCTED BY HARVEY ROBINSON

Detroit Electric Commercial Cars

BY WILLIAM J. JOHNSON

Those who are concerned with the transportation of merchandise will find in the Detroit Electric commercial cars, manufactured by the Anderson Electric Car Company, of Detroit, Mich., U. S. A., much of more than passing interest.

The builders of these cars have had long experience in the electrical field of endeavor and have had abundant opportunity to experiment with commercial equipment. Advantage has been taken of this, at least such is suggested by a minute examination of the chasses from one end to the other.

The Anderson Electric Car Company, in its appeal to public confidence asserts that they build for service. Judged by the actual performance rendered by Detroit Electric commercial cars already in service this statement appears well founded. Doubtless the makers could have reached even further in that slogan in asserting that construction was with the idea of satisfactory, consistent and efficient service. But, of course, that is taken for granted.

The Detroit Electric commercial cars are herein described in detail for the first time.

Electric Delivery Wagon

Fig. 1. 2000 pounds capacity; 84-inch wheel base; 32 x 3-inch wheels forward, 34 x 3½ rear; fitted with curved panel body.

Three Chassis

If a manufacturer can produce one car and make it a success, why not modifications of that type, modifications as regards adaptability to lighter or heavier service as the case may be. The present efforts of the builders are centered in three chasses, identical in construction, since the builders contend that such makes for simplicity and a feature attractive to the user and the individual entrusted with the care of the vehicles.

These three chasses are of 1000, 2000 and 3000 pounds load capacity and the general construction is of course the same with variations for the lighter or heavier work as the case may be.

The wheel base of the 1000 pound car is 80 inches, of the one ton vehicle 84 inches and of the one and one half ton truck 96 inches. The tread is respectively 56, 58 and 62 inches, the clearance from the ground 12, 12 and 11½ respectively. Tires on the small car are 32 x 2½ inches forward and 34x3 inches rear, on the one ton truck 34 x 3½ forward and 34 x 3½ inches rear. On the large vehicle the front tires are 34 x 3½ inches while the rear equipment is 36 x 4 inches.

The approximate speed, vehicles loaded, is 14 miles an hour with the half ton delivery wagon, 12 miles an hour with the ton vehicle and 11 miles per hour in the case of the 1½-ton truck.

Mileage with heavy service batteries is approximately 55 miles on a single charge in the one-half and one ton models and 50 miles on a single charge in the largest car, from which it will be noted that either of the three cars is capable of more mileage on a single battery charge than the vehicle would demand in an ordinary working day.

The total approximate weight, heavy service, is 2660 pounds in the small vehicle, 3400 pounds in the intermediate and 4840 pounds in the one and one-half ton car.

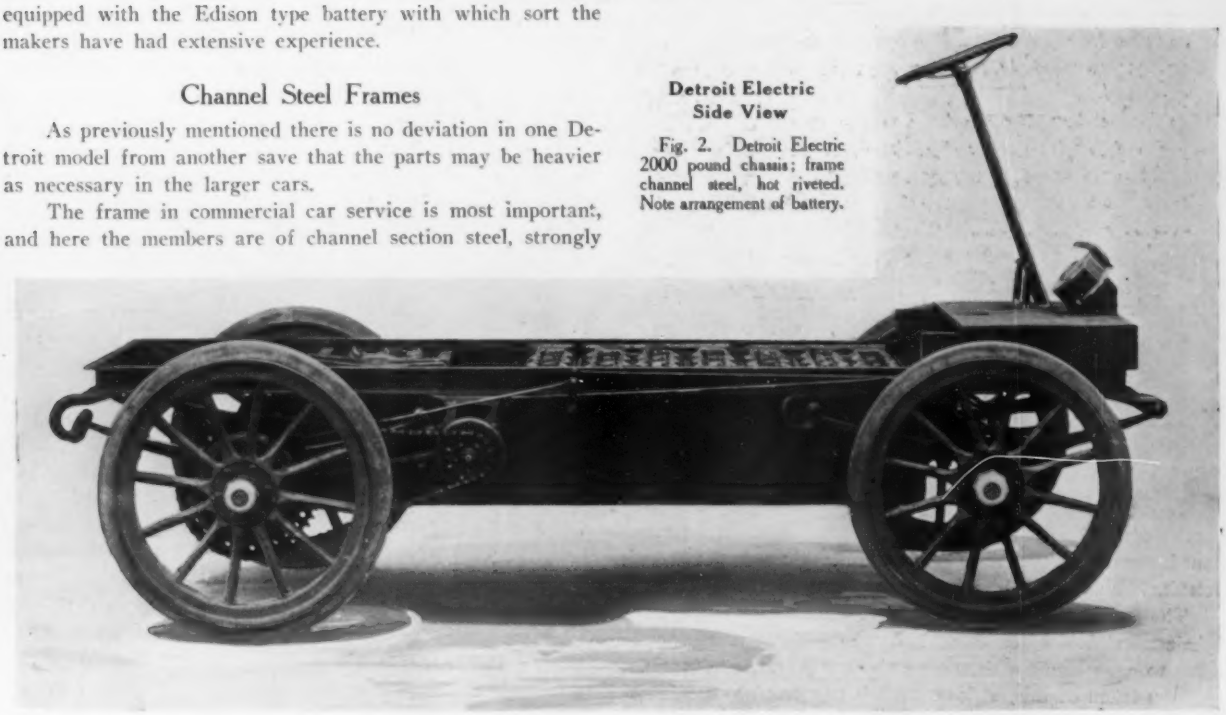
Prices are, of course, governed by the battery equipment and the body desired. Detroit Electric commercial cars are

equipped with the Edison type battery with which sort the makers have had extensive experience.

Channel Steel Frames

As previously mentioned there is no deviation in one Detroit model from another save that the parts may be heavier as necessary in the larger cars.

The frame in commercial car service is most important, and here the members are of channel section steel, strongly



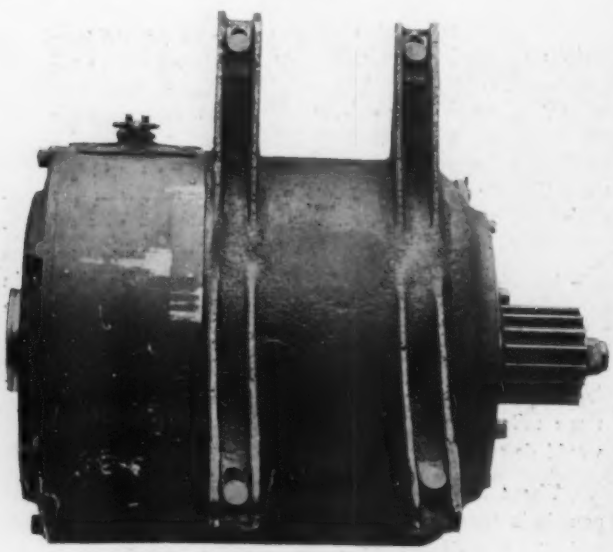
Detroit Electric Side View

Fig. 2. Detroit Electric 2000 pound chassis; frame channel steel, hot riveted. Note arrangement of battery.

corner and cross braced. All riveting is done in the company's own shops, hot, in fact it is the Anderson policy to do things for themselves.

In all three models the channel depth is 3 inches and the frame width is 32 inches in the small car, and 40 inches in the one ton and one and one-half ton vehicles, length being 118 inches, 122¾ inches and 134 inches respectively. Angle steel cross members are employed in all three models these being 1½ x 1½ x 3-16 in all three cases.

Battery and motor are housed in separate compartments which are riveted to the frame.



Detroit Electric Commercial Car Motor

Fig. 3. Note supporting arms cast integral with field ring; commutator cover held in place by two wing bolts; bearings, H. B. Annular.

Ball Bearing Motor

In a unit where a continuous pull or torque is exerted as in an electric motor it is common practice to use plain bearings. Of late there has been a tendency towards a more general use of ball equipment. The single motor in all three Detroit Electric Chasses is provided with two Hess Bright annular ball bearings. The equipment is known as Type 17, is series wound four pole and of the company's own design and manufacture, though the 3000 pound equipment is termed Type 18, the normal voltage being 70 in all three cases, normal ampere rate 30 in the two smaller cars and 48 in the one and one-half ton vehicle, r. p. m. being 1300 in the 1000 and 2000 pound cars, 1120 in the 3000 pound truck.

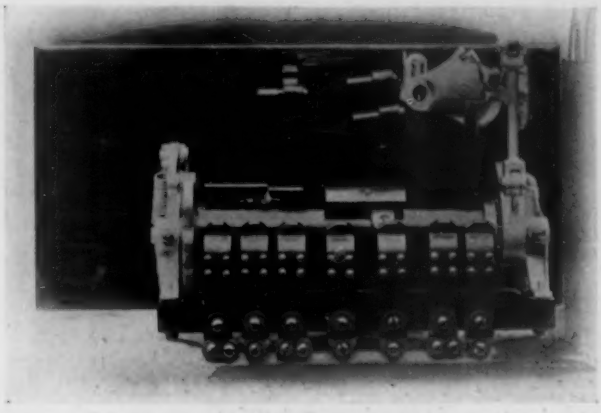
The two supporting arms are cast integral with the field ring and are bolted at each end to the two cross members of the frame provided for the purpose.

Double Side-Chain Drive

Final drive in the Detroit Electric commercial cars is through double side chains. Drive from the motor sprocket to the countershaft is through a Renold silent chain, the countershaft being forward of the motor and supported at either end in cast steel brackets hot riveted to the frame sides. In the two smaller cars the motor sprocket is of 17 teeth, in the 3000 pound model 18 teeth. The differential sprocket has 54 teeth in the 1000 pound vehicle, 62 in the 2000 pound and 65 in the large car.

Chain width and pitch is 2 x ⅝ in the two smaller vehicles, 2 x ¾ in the largest. Countershaft bearings are Hess Bright annular ball.

The front sprockets are bolted to the pressed steel drums on the 1⅜ countershaft in the two smaller cars, these having 16 teeth, in the 3000 pound car 15 teeth, while the rear sprockets which are riveted to the cast steel brake drums are 51 teeth in the 1000 and 2000 pound models and 48 teeth in the 3000



Detroit Controller

Fig. 4. Continuous torque drum type controller and laminated single throw switch, no break in current in going from one speed to another.

pound truck. Diamond roller chains are employed for the final drive, No. 156 equipment on the two smaller cars, No. 151 on the large.

Edison Batteries Used

The Detroit Electric commercial cars are designed to take the well known Edison battery, which is used because of long life, freedom from sulphation and increased radius of reliable action claimed over equipments of other nature. The cells are contained within an underslung metal box which, as before stated, is riveted to the frame. T shaped pressed steel dividers or spacers are secured to the bottom of the box to separate the cells. Edison A4 type is used in the 1000 car, A6 in the 2000 pound vehicle and A8 in the large truck, all three being 60 cells.

Continuous Torque Controller

A drum type of continuous torque controller is employed, this being mounted under the floor board, easily accessible and secured as a unit to cross members of the frame. There is no arc in the change from one speed to another, the member affording five speeds forward and reverse. The resistance is placed to the left of the controller, the latter worked through a hand lever on the steering wheel.

Enclosed Wiring

The matter of wiring of the Detroit Electrics reflects thought. Instead of stringing the cables along the frame sides, these lead from the controller to the front of the battery compartment, where they are grouped in an aluminum Y shaped container bolted to the box, and from this cover they are led through an insulated 1½ inch conduit down along the bottom of battery box, then passing up through the bottom of the box to the motor, the ends of the cables, by the way, being fitted with taper brass plugs into which the cables from the motor are secured, being held tight in the terminals or plugs with set screws. Then when the complete contact without current loss is assured, the whole is taped over ensuring satisfactory insulation. To take down the system is a simple operation.

Axles

Both front and rear axles of the Detroit Electric differ from general construction in that they are arched or slightly raised at the center which, in the opinion of the makers, provides a more staunch member. The front axle is an I-beam drop forging with integral steering jaws and spring seats, the member flaring out at the spring seats. In the small car this is 1½ x 2¼, in the one ton model 1¾ x 2½ and in the large car 1¾ x 3.

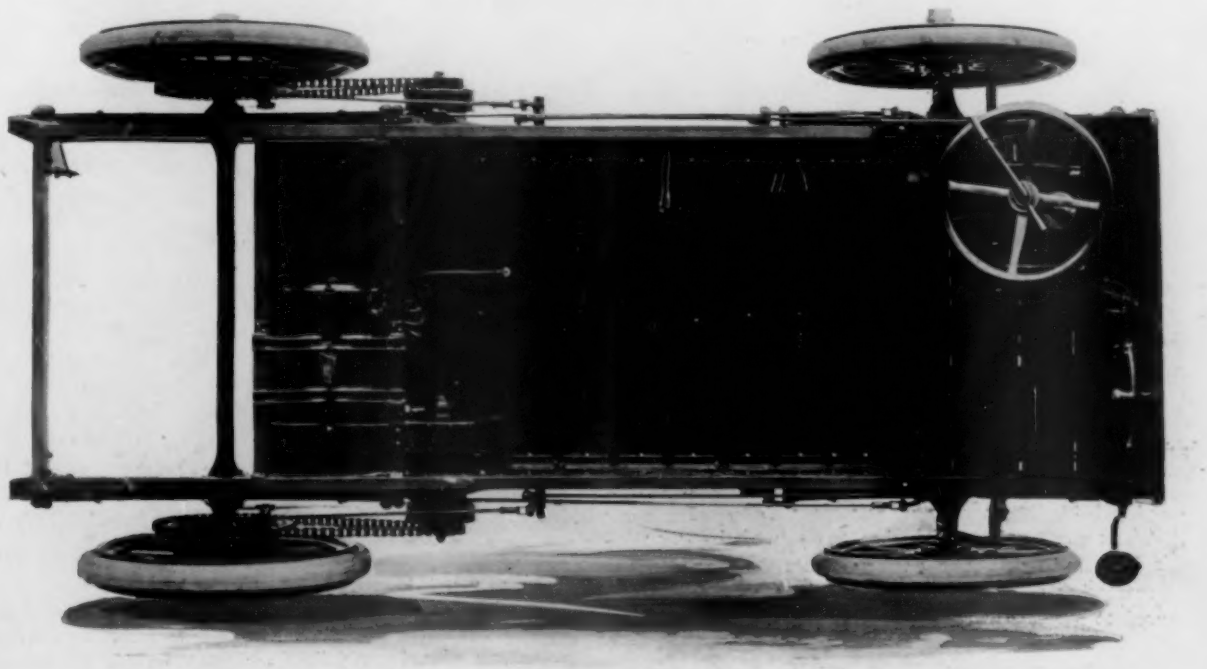
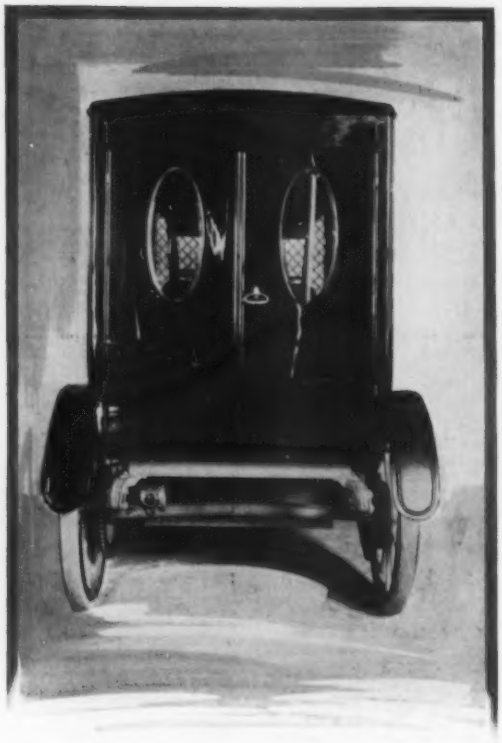


Fig. 5. Plan of Chassis



Rear Axle a Feature

Fig. 6. Rear View of Detroit Electric, showing the arched rear axle.

The rear axle is rectangular in design and is 1¼ x 2⅛ in the 1000 pound vehicle, 1¼ x 2⅛ in the ton model and 1½ x 3 in the one and one-half ton type.

Wheels

Wheels, equipped with solid rubber tires are wood, artillery type, in all three chasses 12 spokes forward members, in the two smaller cars being 32 inches in diameter and 34 inches in the one and one-half ton model, rear members 34 inches in diameter on the two smaller cars and 36 inches in the large vehicle. Wheel bearings front and rear are Timken roller.

Distance rods are fitted in all three models and while the method of anchorage is slightly different in the small car mention of the larger equipment will serve the purpose. These are 1¼ inches in diameter, fitted with yoke ends which are anchored to the rear axles and to the countershaft brackets forward. A distance rod also extends from the forward face of the field ring of the motor to the countershaft, at which point a Hess Bright ball bearing is fitted.

All three members, the two side and motor distance rods are adjustable so that adjustment of side chains is rendered positive.

Two Sets of Brakes

There are two sets of brakes on each of the three Detroit Electric models, two on the countershaft and two on the rear wheels. The countershaft drums are pressed steel secured to the shaft ends, these being 8 inches in diameter and 1¾ inches wide in the 1000 and 2000 pound cars, and 10 inches in diameter and 1¾ inches wide on the one and one-half ton truck. Facing in all three instances is Raybestos.

The rear wheel drums are clipped to the wheels at every other spoke, that is to six of the twelve rear wheel spokes. These rear members are 12 inches in diameter, 2 inch face in the 1000 pound car, 12 x 2½ on the 2000 and 3000 pound vehicles.

Both brake sets are worked through pedals with renewable side lock ratchets, pedals drop forged, and adjustable steel draw bars ⅜ diameter, the brake rocker shaft being ¾ inches in diameter. The inner pedal works the rear wheel brakes, the outer the countershaft members. The rear brake assembly is supported on the rear axles.

Springs

Semi-elliptic springs are fitted forward and rear on all three cars, seven leaves forward and rear. The 1000 pound front equipment is 40 inches long and 1¾ inches wide, 2000 pound sets 40 inches long and 2¼ inches wide, the large car having members 40 inches long and 2½ inches wide.

The rear springs are of the same dimensions. Anchorage is in the usual manner to cast steel brackets on the frame sides, these brackets or shackles being linked with the springs through steel side plates. Anchorage to the axles is through steel clips of heavy dimensions.

Steering

Left side control is featured in the Detroit Electrics, the post, inclined, being 1½ inches in diameter, (wood), wheel 16 inches in diameter. A worm and sector system is employed, the case being cast steel and secured to a forward cross member of the frame. The cross connection is 1¼ inches in diameter and the steering lever, ball jointed, seats in a socket adjustment being provided in the usual manner. The sector and shaft are formed in one piece and thrust is cared for through a thrust bearing.

Control

The speed is advanced through a bronze horizontal hand lever mounted above the steering wheel, this being sufficient-

Rear View of Detroit Electric

Fig. 7. Detroit 1000-Pound Chassis, fitted with curved front panel body.

ly long to ensure easy leverage. Each speed of the controller is locked. The reverse is effected through a smaller hand lever on top of the steering post which, raised from the horizontal to the vertical, accomplishes the desired result. A laminated copper switch, single throw interlocking, is fitted, this being actuated through a foot pedal. The brakes, as previously mentioned, are worked through the pair of drop forged steel pedals which may be locked in position.

Bodies

Either of the three chasses are to be had with various types of bodies. On the weights cited in the foregoing, express bodies are fitted on the small and large cars, panel body on the one ton model. Thus equipped, the small car body is 74 inches long, 42 inches wide and 57 inches high, 2000 pound model 80 inches long, 48 inches wide and 60 inches high, 3000 pound model 100 inches long, 54 inches wide and 62 inches high.

Chassis only, 1000 pounds is $1300, 2000 pounds $1400 and the one and one-half ton car $1650.

Complete vehicles with express body, heavy service, is $2260 in the 1000 pound type, $2825 and $3460 respectively in the 2000 pound and 3000 pound classes.

Overall dimensions are, 1000 pound class: 129 inches long, 66 inches wide, 90 inches high, height from ground, 30 inches. In the 2000 pound car length overall is 136 inches, width 68 inches, height 95 inches, height from ground 34 inches. The overall length of the 3000 pound car is 155 inches, width 74 inches and height 100 inches; height from the ground being 35 inches.

Equipment

Equipment of Detroit commercial cars includes Sangamo ampere hour meter, Veeder hub odometer registering in either direction, extension lamp, two side and rear lights, tools and the like.

The Largest Modern Electric Garage*

BY CHARLES L. EIDLITZ, E. E.

I designate this Gimbel garage as the largest modern electric garage, without fear of contradiction. Unless somebody else has finished one within the last fifteen minutes, this is the most modern, for it was completed just about fifteen minutes ago. Whether or not it is the largest I will leave to your judgment.

The garage is located at 24th street, just west of Tenth avenue, this city. The building itself is two stories in height with a frontage of 150 feet by 100 feet in depth. It is built of brick with concrete arches and roof and is as nearly fireproof as anything can possibly be. It was designed after the architect and builder and the representative of Gimbel Bros. had made an inspection of every garage in New York and vicinity. * * *

Main Floor, Gimbel Electric Garage

On the 1st day of August, 1910, the Gimbel garage was simply a hole in the ground, and on the 15th day of September there was a complete building lacking only the final cleaning up, but ready for business. Mr. William Crawford the builder, who was responsible for this unusual speed and who brought about this remarkable transformation in about six weeks certainly accomplished wonders.

Orders had been given by Mr. Gimbel that he wanted the best and most practical garage building that could be produced. * * *

When I was first brought into the transaction in the middle of July, Mr. Crawford asked me to meet him at Mr. Gimbel's office in relation to a garage auto-charging proposition. There I met a number of gentlemen, including the repsentative of the Studebaker Company, who told me that they wanted to charge about 75 wagons, and who gave me a general outline of their requirement.

On the 1st of August, I submitted a set of drawings and specifications which were approved on the 6th of August, and on the 25th of the same month 595 h. p. in charging equipment for 90 vehicles was in position in the garage with tarpaulins suspended above the charging board in lieu of a roof, which was "poured" into place about three days later.

Current for charging, lighting and power is furnished by the United Electric Light & Power Company from its substation just across the street; * * * supplying 220-volt two-phase alternating for power, 110-volt single-phase alternating for lighting, 75-volt direct and 120-volt direct current for charging.

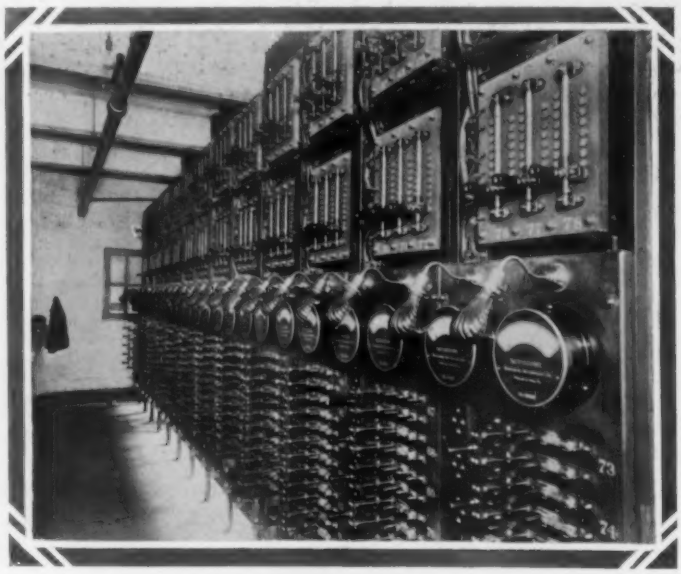
The Charging Board

Now having the current inside the building line we come to the electrical equipment of the garage. The first floor

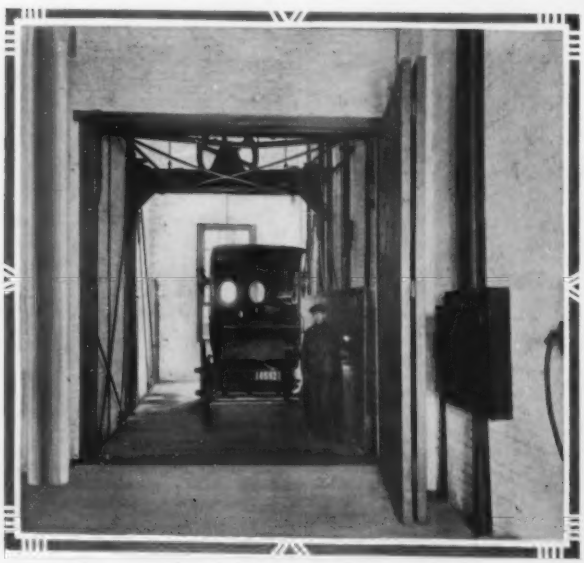
*Paper read before the Electric Vehicle Association of America at Madison Square Garden, N. Y., October 18, 1910.

is devoted entirely to charging. The service board equipped with meters for the various kinds of service stands just to the left of the westerly driveway. Here are switches for each feeder supplying the elevator, motors for machine shop, pumps, lighting and finally 8-1000-ampere switches for controlling the eight sets of 1,000,000 and 500,000 circ. mil. cables feeding the charging board. This service board, 10 feet long and 8 feet high, would be considered quite a sizable board were it not dwarfed by the main board. The feeds are carried under the concrete floor and terminate on the switchboard gallery, which is in the center of the building between driveways. The gallery is three feet off the floor level and 36 feet long. The board is 30 feet in length and including the rheostats is 13 feet in height.

It consists of 13 slabs, each having 6 double-pole, double-throw switches of



The Mammoth Switchboard



Electric Elevator With Street-Car-Like Control

100-ampere capacity, 6 potential plug concentions, 1-ampere meter and 1-volt meter, with 6 Cutler-Hammer sliding contact rheostats mounted above, making a total of 78 switches capable of charging 78 vehicles at one time; 36 of these are fed at 75 volts and 42 at 120 volts.

To the right of the board is an annunciator so arranged that when the plug is connected at the charging end, the chauffeur also inserts a supplementary plug which rings back on the annunciator, indicating the number of the switch on the board which controls his plug.

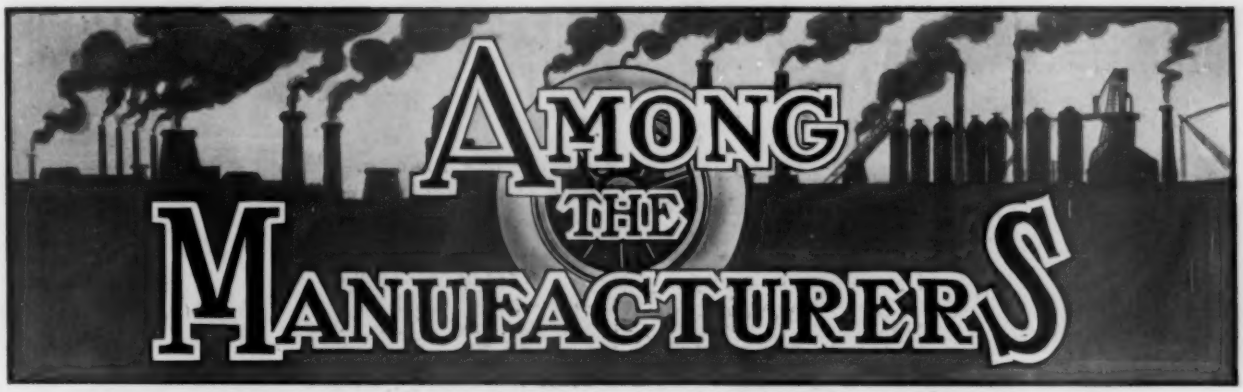
The manipulation of the board is simple and usual. The operator throws his switch to the left, plugs in his potential plug, and reads his meters, operates his rheostat and throws the switch to the right to charge. When the battery is fully charged, it rings automatically on the annunciator at the board, and he opens his switch and notifies the attendant by telephone to uncouple.

The Battery Room

On the second floor are the machine shop, painting shop, tailor shop and chauffeurs' rooms, together with the battery room. Here is a similar but smaller board consisting of two panels, one having 6-75-volt switches, one 6-120-volt switches, 12 rheostats, together with a set of discharging rheostats, so that the batteries may be built up and discharged by plugging into the discharge plugs. A large Otis elevator operated on two-phase alternating current, capable of taking the largest trucks, connects the first floor with the battery room floor. Plugs for hand lamps are provided everywhere.

It would, perhaps, be interesting to give you a few quantities in connection with this plant. The capacity of the boards at full load would be 443 kilowatts or 595 h. p. It required two miles of 1¼ inch to 3 inch Sheraduct conduit and 4¼ miles of Bishop cable from 1 to 500,000 circ. mils. The actual space occupied by the boards to deliver 595 h. p. is 234 square feet of floor space allowing for a passage in front and rear; while 595 horses would require for stall space and passageway alone 29,750 square feet. The stall space alone of 595 horses would therefore require a building as large as this entire garage. Valuing the lots in this plot at $25,000 each, the plot would cost $10.00 per square foot. Stalls would occupy $150,000 as against $2,340 for electric delivery.

The Battery Room



MORA POWER WAGON CO. FORMED

The recently formed Mora Power Wagon Company, of Cleveland, Ohio, will introduce shortly a two-cylinder opposed light delivery wagon. S. H. Mora heads the new concern. W. N. Freeman, formerly with the Mora Motor Car Company at Newark, N. Y., is identified with the new organization and W. H. Birdsall, formerly chief engineer at the Mora plant in Newark, will officiate in a similar capacity.

MOGUL MOTOR TRUCK CO. FORMED

Eugene Goldman, Herbert Haase and Frank Dawson, formerly general manager, sales manager and manufacturing superintendent, respectively, of the Randolph Motor Car Co., resigned their positions on March 1st to form the Mogul Motor Truck Co. in Chicago, Ill. The new concern will manufacture 2½, 3½ and 5-ton trucks in Chicago, and they expect to be in the old Randolph factory at Root Street and Princeton Avenue by May 1st.

TO BUILD SAURER TRUCKS

The organization of the Saurer Motor Co., which is headed by a number of New York capitalists who have acquired the American rights on the Saurer motor truck from Adolph Saurer, Arbon, Switzerland, was perfected at a meeting held in the new company's headquarters, 30 Church street, New York, on March 25. The new company is incorporated under the laws of New Jersey and capitalized at $1,600,000, of which $600,000 is preferred and the balance common stock. The entire amount is paid up, and the company will immediately begin to manufacture three, five and seven ton Saurer trucks at its plant at Plainfield, N. J.

GAGGENAU TRUCKS USE STEEL WHEELS EXCLUSIVELY

The Benz Auto Improvement Co., 250 W. 54th street, New York City, announces that the Gaggenau trucks are being imported with an exclusive equipment of Krupp cast steel wheels instead of wood. These wheels are claimed to be much superior to wooden wheels, in fact, are practically indestructible as far as wear in service is concerned. They do not swell, shrink or work, or in any way show the effects of the weather. Contrary to what might be expected, there is a reduction in weight on the six ton trucks, due to the use of steel instead of wooden wheels, of about five hundred pounds.

NEW MOTOR TRUCK COMPANY

The Cleveland Motor Truck Manufacturing Company, of Cleveland, O., has been organized with a capital stock of $250,000 to manufacture heavy motor trucks for commercial use. The trucks will have four-wheel drive and steer, using the McGeorge wheel.

IDEAL ELECTRIC TO MAKE TRUCK

The Ideal Electric Co., of Chicago, Ill., has changed its name to the Ideal Electric Vehicle Co. The capital has been increased to $250,000, and a new two-story brick factory at 308 E. Huron street has been acquired. Besides making the Ideal Electric Brougham, the company contemplates the manufacture of a one ton truck. J. D. Wiggins has been secured as general superintendent of the factory.

A new Firestone service depot has been opened in Washington, D. C., by Meeley the Tire Man, at 1736 Fourteenth street, N. W.

The Willard Storage Battery Company of Cleveland, Ohio, is building an addition to their plant, which will add 8000 square feet of floor space.

The Pneumatic Tool Co., of Cleveland, Ohio, is contemplating building a plant in Aurora, Ill., for the manufacture of commercial cars.

The Swinehart Tire & Rubber Company has opened a new office at 1924 Broadway, N. Y. City, under the management of E. O. Hoopengarner.

The J. S. Bretz Company, New York City, are again sole selling agents for the Hartford Auto Parts Co., makers of the well-known Hartford Universal Joints and Clutches.

The Uncas Specialty Company of Norwich, Conn., has increased its capital from $50,000 to $100,000, and has changed it name to the Sterling Machine Company, which will continue to manufacture the same specialties as heretofore.

The Newark Automobile Mfg. Co. has been recently incorporated with $500,000 capital to manufacture a line of commercial cars, and will also operate a taxicab service in Newark, N. J. The Company's office is in the Continental Hotel, and is in charge of C. J. Paul and J. P. Walsh.

Joseph Tracy, the well known Consulting Engineer is now engineer for the Morgan Truck Co., Worcester, Mass.

David C. Fenner, formerly with the Knox Company, is now in charge of the truck division of the United States Motor Co.

The Automobile Maintenance & Manufacturing Company, of Chicago, Ill. announces that the name of the Company has been changed to the Walker Vehicle Company.

The Hart-Kraft Motor Company, of York, Penna., which recently went into the hands of a receiver is now being operated under his management with the expectation of reorganization at an early date.

The Swinehart Tire & Rubber Company, of New York has moved to 1924 Broadway. Manager E. O. Hoopengarner predicts that within a short time the volume of business in motor truck tires will exceed that in pleasure car tires.

David C. Fenner has been appointed sales manager of the Alden Sampson Mfg. Co., succeeding C. E. Stone, who has been appointed manager of the company's New York office. Mr. Fenner is a well-known technical expert, having graduated from Yale and the Massachusetts Institute of Technology.

Columbus, Ohio, has now two new motor patrol wagons in service, which are products of the Studebaker Automobile Company. The autos carry twelve people and have a guaranteed speed of 45 miles per hour. They have replaced three horse drawn vehicles, which have been condemned and will be sold to smaller cities.

The tire makers in Akron report that business is brisk. In some instances the factories have been operating nights to keep up with the demand. The Firestone Tire & Rubber Company will shortly remove to the new modern up-to-date factory. The old quarters will be retained for some of the departments of the factory.

An investigation recently conducted for a department store in Portland, Ore., by the Grabowsky Power Wagon Company showed how the former might save $16,524 a year by exchanging its thirty-four horses and fifteen wagons for five machines of one-ton capacity. The accounts, calculated on a basis of five years' operation for both forms of transportation.

The New Departure Mfg. Company, of Bristol, Conn., manufacturers of a high grade line of specialties, including a complete line of ball bearings, have opened a western branch at Rooms 1016-1017 Ford Bldg., Detroit, Mich. The company will maintain an engineering and sales force at this branch, which will be immediately available to the many customers in Detroit and the west.

John R. Ide has resigned his position in the Sales Department of the Hyatt Roller Bearing Company, and has engaged with the New Departure Mfg. Company, makers of the well known New Departure ball bearings. Mr. Ide will continue to reside in Detroit, and will be connected with the western branch of the New Departure Company, which is shortly to be opened.

B. D. Gray, Chief Engineer of the American Locomotive Company, Providence, R. I., has tendered his resignation to that Company.

The Service Motor Car Co. is to move its plant from Kankakee, Ill., to Wabash, Ind., following the subscribing of $40,000 to the capital stock of the company by Wabash investors.

The Pederson Lubricator Co., of New York City, having been recently organized with a capital stock of $25,000, will devote its entire efforts to the manufacture of lubricating devices, particularly as applied to automobiles and motor boats. In addition to the Pederson type of lubricator, new taxicab oiling devices and small rotary pumps will be manufactured, as well as special indicators and oiling devices.

The United States Tire Company will fill, through its four big branches, the G. & J., Morgan & Wright, Continental and Hartford Rubber plants, an order for 50,000 tires received from the United States Motor Company, which controls the output of Columbia, Maxwell, Brush and Stoddard-Dayton motor vehicles. This is said to be the largest single order yet given for tires by any single company.

The American Bronze Co., of Berwyn, Pa., makers of Non-gran high speed bearing bronze, are just completing a large addition to the foundry and machine shop. The construction is absolutely fire proof and is one of the most modern and best lighted and ventilated plants in the country.

This addition greatly increases their facilities and enables the company to take care of the rapidly increasing demand for these high price bearings.

The Hatfield Company, manufacturers of the Hatfield motor wagon, Cornwall-on-Hudson, New York, are moving their plant to Elmira, New York, where they will have greatly enlarged facilities for the manufacture of their trucks. Their new plant has about 60,000 sq. ft. of floor space and the Hatfield Company contemplates a production of 1000 cars a year commencing April 1, 1911. W. N. Taylor, who formerly had charge of the Pope-Toledo plant, will be the superintendent.

MATHEWSON JOINS WYCKOFF FORCES

Brockholst Mathewson, who has been for ten years in the advertising department of "Collier's Weekly," has resigned to take an executive position with the enlarged Wyckoff, Church & Partridge Company, New York City, manufacturer of trucks and touring cars.

At the age of fourteen he went to work as a railroad newsboy. Subsequently, he learned the machinist's trade. He was scarcely a full-fledged journeyman when he was taken from his lathe to become a machine salesman for this firm. He then became salesman for the Bridgeport Gun Implement Company. At the age of twenty-one, he was made advertising manager for the B. G. I. Company. In 1901 he was offered the position of New England representative of "Collier's Weekly."

He made Collier's second to none as an automobile medium and has now connected himself with Wyckoff, Church & Partridge Company, which will be known henceforth as Wyckoff, Church & Partridge, Inc.

The Wyckoff people have secured rights to manufacture the Commer truck in this country, and are now perfecting manufacturing plans. As part of the new policy, they will manufacture the Guy Vaughan Automobile, a pleasure car; but the automobile truck will be the main concern of the newly reorganized firm.

Before you forget it
send us your subscription

¶ This is a sample. Good isn't it? It costs us thousands of dollars every month to gather the data published in each issue. It will cost you but a dollar a year. What is the information worth to you? It's certainly much more than the subscription price. Do it now—*to-morrow may be too late.* Those who succeed are those who don't procrastinate.

Chilton Company
Market and 49th Sts., Philadelphia 1911

Dear Sirs:—

Enclosed find one dollar, for which enter our subscription to the Commercial Car Journal *for one year, starting with the ..... number.*

Currency or stamps may be sent at our risk.

P. S.—We would appreciate your sending us your letter head or business card, so that we can classify our subscriptions.

HAZARD
POWER PLANTS
Have Stood the Test

¶ Recently our Motor Power Plants were put to exceptionally severe tests by several manufacturers of Motor Trucks

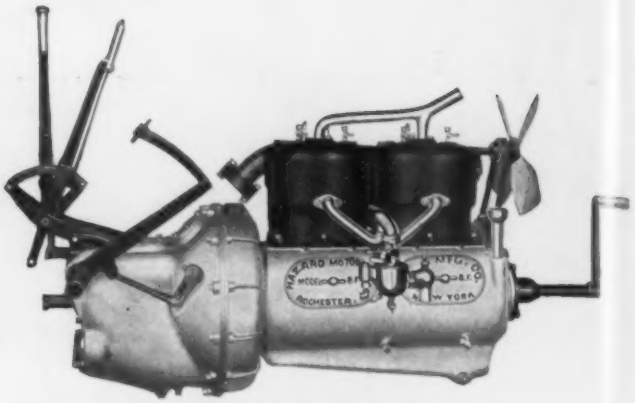
¶ They met the hard and exacting test put upon them fully and squarely, and proved sturdy, dependable and reliable in every particular.

Let us furnish you the exact details

These **Power Plants** are especially adapted to commercial car service and are worth all, and then more than they cost.

Powerful Power Plants with A-1 reputation. **Power Plants** that will stand the hardest test, last longer and give maximum results.

View showing control set mounted and connected to gear shifting shafts. Pedal and emergency brake installed for either right or left hand driver of car.



Interchangeable
POWER PLANTS

¶ You are a ***far-sighted manufacturer.*** Are you incorporating in the construction of your motor business vehicles Interchangeable Motors or Power Plants ?

¶ Service companies to-day operate any number of wagons of the same make. Should a driver bring in a troublesome car, it is so easy to lift out the motor that is acting badly and slip in another that is known to be in good condition—if the power plant installed is the

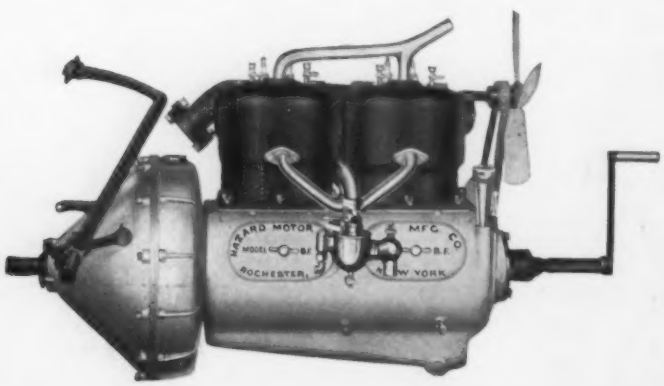
HAZARD INTERCHANGEABLE STRICTLY THREE POINT SUPPORT

UNIT POWER PLANT

WITH CENTER CONTROL

Motor and Clutch Unit

Designed for commercial car builders using Jackshaft and transmission built in a unit. Also where transmission is on rear axle.



¶ The above cut plainly shows this Power Plant with the gear shift lever and emergency brake mounted on transmission. Center control of speed gears is the more practical for commercial cars. Nothing to interfere with driver or helper getting in or out of car. Furthermore all installation and connecting up cost of gear shifting apparatus is eliminated.

24 and 30 H.P.

HAZARD
MOTOR MFG. CO.
ROCHESTER, N. Y. TAKE ALLEN AND JAY CAR TO END OF LINE

Selling Trucks by Post Cards

Some of the largest makers of commercial cars are using Chilton Post Cards in Colors to sell their product direct to the consumer.

It's an economical form of personal appeal advertising. A picture of your car with the principal facts enumerated goes right into the hands of the man you want to reach.

Color picture post cards always have been popular for personal correspondence, and when used for advertising purposes they make the very strongest form of personal appeal publicity.

In selling trucks the manufacturer selects just the people he wants to reach and sends them just the information that suits their cases. For instance, he sends brewers cards illustrating trucks he is selling brewers, and thereby makes his advertising copy personal.

We can give you specific instances where a few dollars spent for post cards and stamps sold thousands of dollars' worth of trucks. If you will ask for the evidence we will send it promptly.

Did you ever stop to consider that the man who can buy commercial cars is a busy business man? How many truck catalogs will he read if received unsolicited? This same man would read and digest all you could send on a post card.

The expense of post cards in colors is almost nothing as compared with catalogs and other forms of elaborate advertising literature, and the results are ten times as great.

We are specialists in the personal appeal post card business, and if you will tell us the fields you want to reach we will do the rest. CHILTON COMPANY, Market and 49th Sts., Philadelphia, Pa.

Wheel for Heavy Motor Truck

The Schwarz Wheel

has become recognized as the standard of quality. The question usually asked of a wheel maker by a wheel buyer is: "How do your wheels compare with the Schwarz?"

There is no secret about the success of our wheels, for we use the best of selected stock and our construction insures greatest strength.

Schwarz Patent Spokes

Spokes at the tenon are grooved and mortised and interlock, forming an absolutely compact, immovable assemblage, which cannot loosen under the most severe strain. The only wheel with positive and evenly distributed spoke support. Can be made and shipped complete without hub.

We were pioneers in the manufacture of the heavy truck wheel, and have made of it a careful study. We maintain a special, fully equipped department for this work, and are prepared to design and proportion wheels in proper keeping with the other features of construction. Our engineers are at your disposal.

All the leading manufacturers of Motor Trucks use the **Schwarz Wheel**—strong evidence of its superiority. It is the only wheel which will stand up continuously under heavy stress.

Send for Illustrated Booklet

Don't hesitate to write us for fear our prices are too high. We sell wheels as cheap as you can buy satisfaction.

The Schwarz Wheel Company

Frankford, Philadelphia

Cash Prizes for Contributions from Motor Truck Operators

Drivers of Commercial Motor Cars or the men in charge of garages or shops are invited to send short contributions to

The Commercial Car Journal

on any subject which will be of interest to our readers—such matters as difficulties encountered and overcome, tips on roadside repairs, or shop repairs, interesting photographs, unusually meritorious performances of any kind, etc.

We would like to have your ideas on the following and other features of truck service:

"What arrangement between employers and chauffeurs will insure the greatest motor truck service with the least expense?"

"Is it advisable to fine drivers for accidents and breakages, or to give rewards for freedom from accidents and trouble?"

"Is anything gained by making each driver responsible for the condition of his vehicle, and giving rewards for good condition or penalties for poor condition?"

"Does it pay to give a bonus for careful operation, or for largest number of deliveries or greatest ton mileage per dollar of cost of operation?"

"Is it necessary to limit mechanically the speed of trucks and to equip them with recording devices?"

Do not hesitate to give us your view on these or any other features of the service, which in your opinion can be improved.

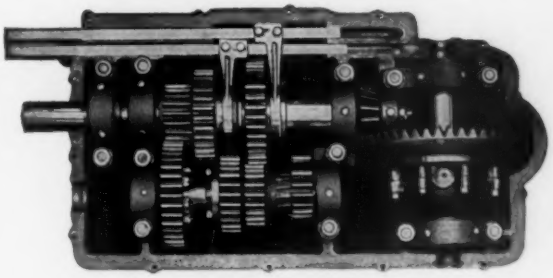
No matter how your letter is written or worded, we will put it into proper shape. When writing use one side of the paper only.

$5.00 will be paid each month for the best contribution, and $3.00 a column will be paid for contributions published which do not win a prize.

In addition, we will give a prize of $25.00 to the contributor who wins the largest number of monthly prizes during the year, and a second prize of $10.00 to the contributor who has the largest number of individual contributions inserted in this department during the year.

This Contest is Open for All

Send in your article as soon as possible to the CONTRIBUTION CONTEST DEPARTMENT, CHILTON COMPANY, MARKET AND 49TH STREETS, PHILADELPHIA.



Type No. 750

Brownell Truck Transmission

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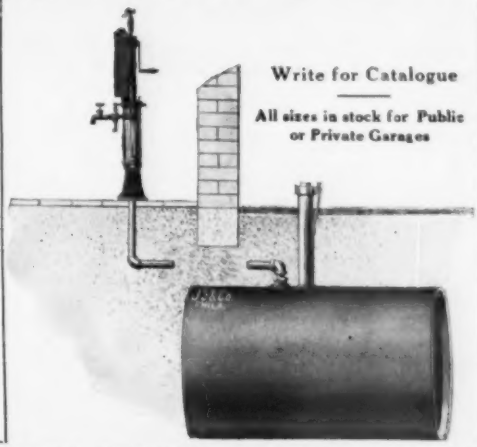

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